RAILROAD GAZETTE

FRIDAY, NOVEMBER 1, 1895.

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Contributions.

Solid Floors for Railroad Bridges.

The New York, New Haven & Hartford Railroad Co.,
MT VERNON, N. Y., Oct. 26, 1895.

TO THE EDITOR OF THE RAILROAD GAZETTE:

I have been especially interested in your article this week on "Solid Floors for Railroad Bridges," and as these floors have always seemed to me cumbersome and unmechanical, I was struck by the expression that their use was extending quite as rapidly "as one could expect."

Aside from the great additional cost incurred by the adoption of these floors (in an extensive structure in this vicinity the solid floor costs more than all the rest of the ironwork), one of the principal objections, as you state, has been the difficulty in defining the strains in the floor.

Since Mr. Goldmark appears to have successfully solved this problem, and gives results which are independent of the relation of the concentrated load to the stiffness of the rail, or of the floor itself, and also finds no practical difference between a continuous rail and one cut directly under the load, would it not be worth while also to publish the exact methods by which these results are obtained? HENRY B. SEAMAN.

[Mr. Goldmark's demonstration will be found in full in the *Journal of the Association of Engineering Societies* for August, 1895. Mr. John C. Trautwine, Jr., Secretary, 419 Locust street, Philadelphia, Pa. The price of the *Journal* is 30 cents a copy.—EDITOR RAILROAD GAZETTE.]

The Future Soft Coal Locomotive.

CHICAGO, Oct. 24, 1895.

TO THE EDITOR OF THE RAILROAD GAZETTE:

As at the next meeting of the Western Railway Club there will be a discussion upon the subject of wide fireboxes, it may, perhaps, be a good time to say a word or two as regards the firebox and boiler which we may expect in the future as affording the highest obtainable efficiency which we will be able to reach in the use of soft coal for locomotives.

The fully developed engine of the future will have a moderate sized grate, as compared with many which are now being used, which are in some cases so large that a considerable quantity of fuel is only partially burned in the effort to keep them covered under all conditions of service.

The flame-way will be much longer than in ordinary practice to day, especially when compared with engines having the shallow fireboxes. The requisite length of flame-way will be obtained partly by a well-arranged brick arch and partly by the shape of the firebox, either by deepening the same, or, in case of boxes over the frames, by extending the upper part into the boiler shell, forming a combustion chamber.

There will be a deflector over the fire door to throw the cold air down towards the fire when the door is open, instead of passing directly towards the tube sheet. There will also be an ample supply of air over the fire to burn the hydro-carbon gases.

The boiler capacity and heating surface will be larger, as compared with the grate area, than now holds, when very large grates are used. A moderate sized grate will take care of a larger boiler than is now usually furnished.

The ability of the tube surface to absorb heat from the heated gases will be increased by making the tubes corrugated, the corrugations being of merely a slight curve, so as not to interfere with cleaning the tubes, a change of diameter of ¼-in. in each 3 or 4 in. being sufficient to serve the purpose.

Lastly there will be some form of feed water heater in the front end, which will use a portion of the heat both of the exhaust steam and of the gases coming from the tubes.

This combination presents all the necessary conditions for comparatively complete combustion, and for the utilization of the major part of the heat developed by such combustion. The result will be an evaporation in pounds of water to the pound of coal, considerably higher than we now obtain in ordinary practice. It will be noticed that these remarks refer merely to the steam making, the question of steam using involving another line of research.

There is no difficulty with methods already developed in stationary boilers, of obtaining in pounds of water to the pound of coal, 75 or 80 per cent. of the calculated heating value of the coal, so that quest may be considered closed.

The above outline of boiler construction for locomotives, will bring us probably to the ultimate figure which can be reached in the same direction, and the above is offered largely as a matter of record for reference in the future.

C. M. HIGGINSON.

The Fast Run from Chicago to Buffalo.

On Thursday, Oct. 24, the Lake Shore & Michigan Southern ran a special train from Chicago to Buffalo in 8 hours 1 minute 7 seconds, or at the rate of 63.61 miles an hour, thus beating all previous records for long distances; that is to say, for distances over 148 miles; and it is noticeable that the best division run made with this train was by an engine with 5 ft. 8 in. drivers.

The train was a special of three cars and was run for Dr. W. Seward Webb, President of the Wagner Palace Car Co. There were no passengers on the train except Dr. Webb and some newspaper men; but the Superintendent and a number of other officers of the road, including division officers over their own divisions, were aboard.

The official report, made up by General Superintendent W. H. Canniff is as follows:*

SPECIAL TRAIN, ONE HUNDREDTH STREET, CHICAGO, TO BUFFALO CREEK STATION, N. Y., OCTOBER 24, 1895.

	Time. A. M. H. M. S.	Miles.	M. S.	Stops. M. S.	M. r. h.
Lv. Chicago (100th st.).	3 29 27				
Ar. Elkhart.....	4 54 53	87.4	85 26		61.3
Lv. Elkhart.....	4 57 01			2 11	
Ar. Toledo.....	7 01 39	133.4	134 35		61.24
Lv. Toledo.....	7 04 07			2 28	
Ar. Cleveland.....	8 50 13	107.8	106 06		60 96
Lv. Cleveland.....	8 51 58			1 45	
Ar. Erie.....	10 17 30	95.5	85 32		66.99
Lv. Erie.....	10 19 48			2 18	
Ar. Buffalo (Buffalo Creek Station).....	11 30 34	86.0	70 46		72.91
Total, stops deducted.		510 1	472 25	8 42	
Deduct 2 min. 5 sec. actual stop Toledo Division, account flag.....			2 05	2 05	
Total, start to finish, including 5 stops, 24 slow downs for railway crossings and 14 other slow downs....		510.1	481 07		63.61

Three drawing-room cars.....204,500 lbs.
Engine and tender, engine, 104,000 lbs.; tender, 80,000 lbs.....184,000 "
Total.....488,500 lbs.

Ten-wheel engine, Erie to Buffalo Creek. Engine, 114,000 lbs.; tender, 84,000 lbs. Total, 198,000 lbs.

The locomotives are described elsewhere in this paper. Some of the men on the train came through to New York by the Empire State express, which leaves Buffalo at 1 p. m., Eastern time, arriving in New York at 10.15 p. m. These men thus made the trip from Chicago (100th street) to New York, 952 miles, in 17 hours 45 minutes, or at the rate of 54.2 miles an hour, including stops. This is probably better time than was ever made by the Exposition Flyer of 1893, and the fastest for over 540 miles ever made. The schedule time of the Flyer was 19 hours 57 minutes, equal to 48.2 miles an hour (964 miles), though on some occasions when it was behind time it traveled faster than this for probably a good deal over 500 miles. On Aug. 29, 1893, it ran from Buffalo to Chicago, 525 miles, in 10 hours 10 minutes, equal to 51.6 miles an hour. The Exposition Flyer weighed about 191 tons without the dining car, so that, it will be seen, it is nothing new for the Brooks engines to make fine records.

The Chicago *Tribune* sent two reporters and an artist along with the train, and one of these men delivered copies of that paper, for Oct. 24, in New York City on the evening of the same day. The *Tribune's* account (Oct. 25) is full and intelligent, with rough portraits of the principal men on the train. From the details given, it would appear that the time made by the train was about as fast as it is possible to accomplish, with these engines, with so heavy a load. The stoppage caused by the flagman near Port Clinton, O., proves to have been necessary, the man with the flag having discovered a rail in such bad condition that he did not deem it safe to allow the train to run over it at full speed; but aside from this, the conditions seem to have been uniformly favorable; that is, the drawbridges and railroad crossings were all clear and there was no loss of time in changing engines. Every highway crossing was guarded by a section man who went on duty half an hour before the train was due, and every switch was spiked at the same time. For 400 miles no train, passenger or freight, was passed in motion. The only important adverse circumstances shown in the accounts was the frost on the rails for the first 100 miles or so. How much importance should be given to this it is impossible to estimate on the information at hand.

The *Tribune* says that engineer Trunkey, who made the splendid record from Erie to Buffalo, had only two inches of water in the tender when he finished the run. Mr. Willard A. Smith, who was on the train, states that on this last division a distance of 86 miles was run at 72.94 miles an hour, and 33 miles at 80.4 miles an hour, making the passengers "nearly breathless with admiration and suppressed excitement." For one mile west of Brocton the rate was 92.3 miles an hour, and many single miles were timed at 88 miles an hour. From Erie to Harbor Creek, 7½ miles, the grade is 15 ft. per mile ascending; this was run from the start at an average of 55 miles an hour. The engine resumed her regular trips the next day in good condition.

The Lake Shore & Michigan Southern is more nearly straight and level, we believe, than any other road in the country of equal length. Going east there is no grade steeper than 16 ft. to the mile, except one short grade of 25 ft. between Chicago and Elkhart, and the line is double track all the way. For some miles near Buffalo there is a continuous, though slight, descent eastward. Whether or not this fact is important in comparing the work of the other engines with the superior performance on the Buffalo division, we do not know. It does not appear that the train stopped at Buffalo Creek.

* Mr. Canniff has also issued a circular showing the sizes of the engines, etc., to which he has prefixed the memoranda of the recent New York Central and English runs that appeared in the *Railroad Gazette* of Sept. 20. The data shown in this circular appear on page 722.—EDITOR.

Baltimore & Ohio New 60-ft. Postal Car.

The Baltimore & Ohio has very recently had four postal cars built by Pullman's Palace Car Company, which represent the latest improvements in this class of car construction. Through the courtesy of Mr. E. W. Grieves, Master Car Builder, we are able to give drawings of them.

These cars have no end platforms, except small ones, 12 in. wide, if such can be called end platforms, formed by the sub-sills. The inside length is 60 ft., and the width is 9 ft. 1 in. The length over sub-sills is 62 ft 8 in., and over couplers is 63 ft. 11 in. The cars have Pullman vestibule diaphragm plates without the rubber diaphragms. The Westinghouse automatic brakes with 14 in. cylinders and quick action triple valves are used. The hand brake wheel is placed against the end of the car five feet above the sub-sill with a chain passing down through a hole in the sub-sill and over a sheave to connect with a pull rod. The Westinghouse train signal is also employed. The cars are equipped with Buckeye couplers with the latest improvements for passenger cars, and buffer plates to suit the Pullman diaphragm.

They are lighted with Pintsch gas, eight lamps per car being used. The storage cylinders have sufficient capacity to light the cars for 45½ hours with all lamps burning. In addition to the gas lamps, each car has eight oil lamps for use in case of emergency. The Gold system of steam heating is employed in connection with the Baker car heater. Six-wheel trucks are used, the distance between centers being 43 ft. 8 in.

Fig. 1 shows the side frame at the distribution end of the car, Fig. 2 the end framing and vestibule diaphragm attachments, and Fig. 3 the under frame. The side sills are each composed of two 4 in. × 8 in. yellow pine timbers bolted together. A plate of iron ½ in. × 7 in. extends 18 ft. back from the end-sills between these two pieces. The inner piece is gained one-half inch deep to receive this plate. The inner half of the side sill is let into the end sill with 1⅝ in. × 1½ in. double tenons, while the outer half is gained 2 in. deep at the end to receive the end sill, and is beveled at the corner corresponding to the angle of the end sill. The center sills are 5 in. × 8 in. yellow pine reduced to 4⅜ in. × 8 in. between bolsters, and plated on the outside with ½ in. × 7 in. × 18 ft. iron plates bent around to form an angle against the end sill. The intermediate sills are 4 in. × 8 in. yellow pine, and both center and intermediate sills are let into the end sills with 1⅝ in. × 1½ in. double tenons.

The bridging between sills is made of 1¾ in. × 8 in. pieces secured to the sills by double tenons except at the body bolsters, where the bridging is 6 by 8 in. The under frame is securely tied together with ⅝ in. tie rods spaced as shown in Fig. 3. The end sills are 8 in. × 8 in. white oak secured to the side sills with ¾ in. × 7 in. wrought iron knees placed inside, and bolted with ¾ in. bolts. They are strengthened with ¾ in. × 6 in. × 6 in. angle irons gained flush into the face of the end sills and ¼ in. deep into the bottom. The sub-sills are of white oak 7 in. × 12 in. at the center, and 7 in. × 6½ in. at the ends, bolted to the end sills, the bottom being flush with the bottom of the angle iron on the end sill. They are faced with a ⅝ in. iron plate. The needle beams are 4½ in. × 8 in., those at the center being trussed with ⅝ in. iron rods, and those toward the ends not trussed. All are bolted to the sills, and have cast-iron caps on the ends.

There are four body bolsters, two at each end spaced 2 ft. 5 in. on each side of the center plate. An elevation of one of them is shown in Fig. 3. They are formed of two plates of iron, the upper plate being 1¼ in. × 8 in. and

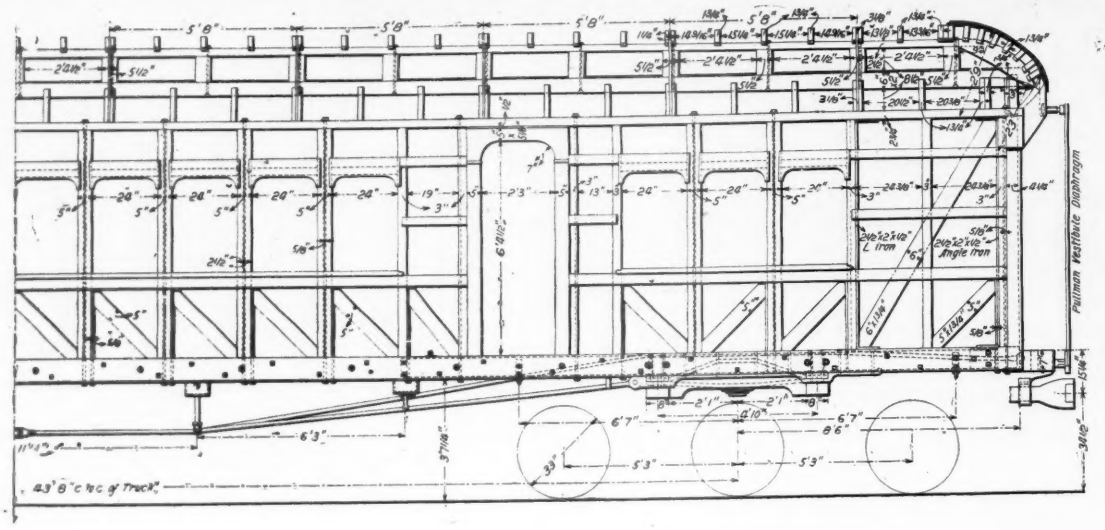


Fig. 1.

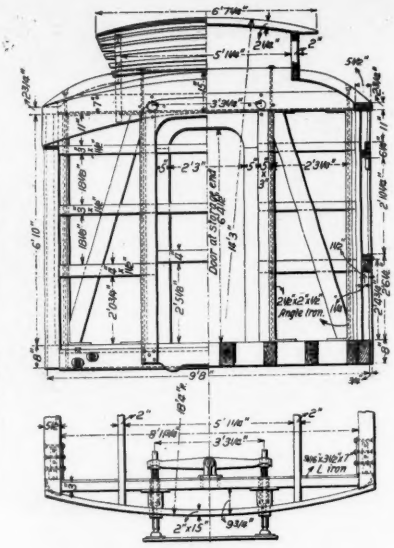


Fig. 2.

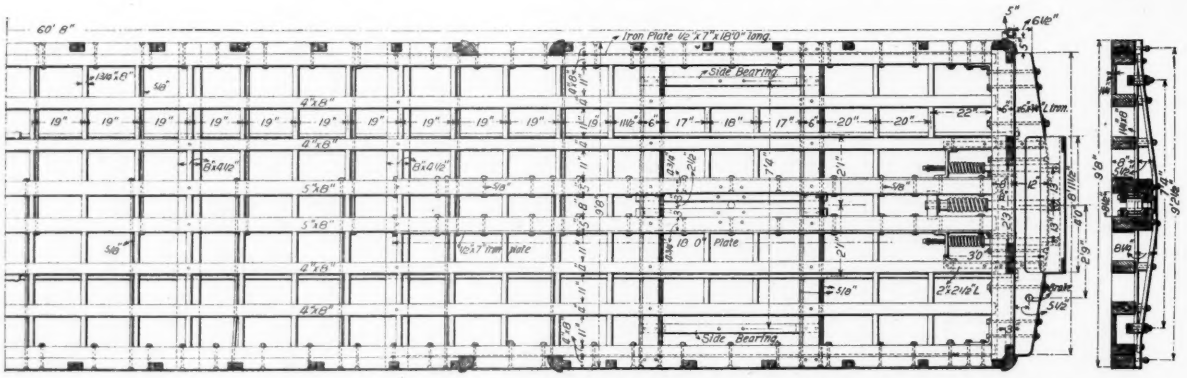
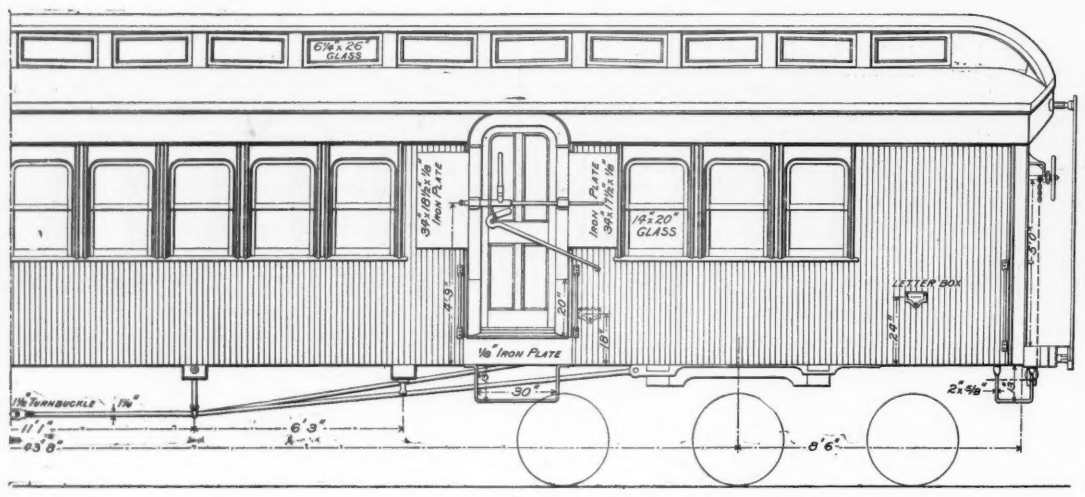


Fig. 3.

Elevation and Plan of Framing.



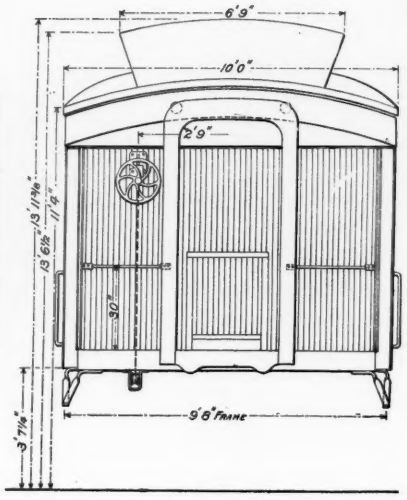


Fig. 4.—Side and End Elevation.

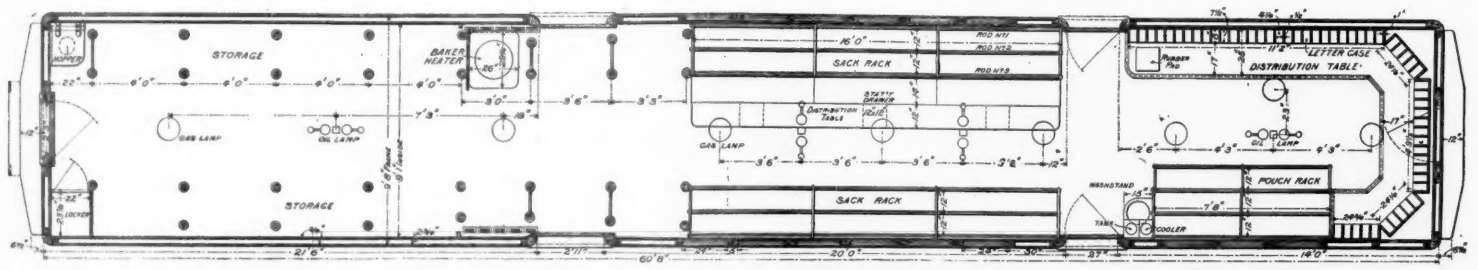
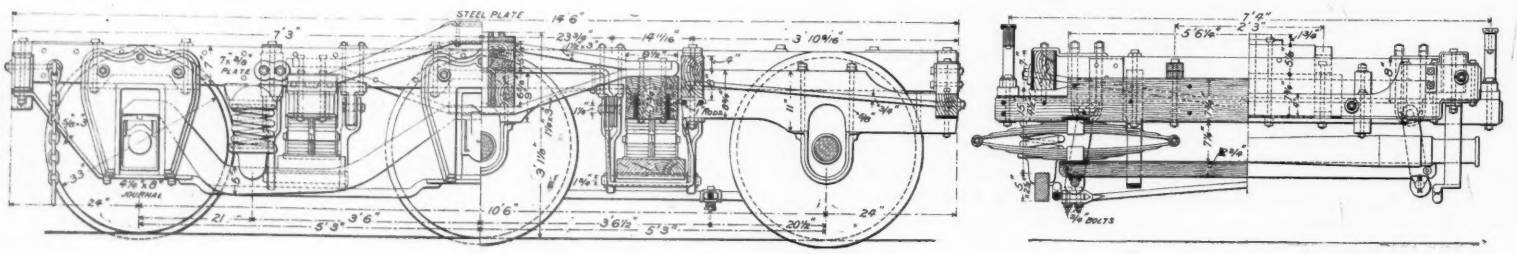


Fig. 5.—Plan.



Six-Wheel Passenger Car Truck.

SIXTY-FOOT POSTAL CAR WITHOUT END PLATFORMS—BALTIMORE & OHIO RAILROAD.

E. W. GRIEVES, *Supt. Car Department*

B. B. CAMPBELL, *General Manager*

the lower 1½ in. × 8 in. These are bolted to the sills as shown. There are also four cross bolsters, shown dotted in Fig. 1, each being made of two 1¼ in. × 3 in. iron bars. They are placed between the center sills and their ends extend through between the plates of the body bolsters. Cast iron thimbles are here used to separate the plates of the body bolsters, and ⅞ in. bolts hold body and cross bolsters together. Filling castings are put between the cross bolsters at the center. Body side bearings are also double, and made of ¾ in. × 3 in. iron bars, their ends bolted to the body bolsters, and the bars separated by cast-iron thimbles. Steel friction plates ⅜ in. × 3 in. are bolted to the bottom to bear against the truck side bearings.

The flooring is 1 1/16 in. yellow pine in two courses, the lower being made diagonally, and the upper longitudinally. There is a deafening ceiling of three courses of ⅞ in. white pine fitted in between the sills. The side and end body posts are of yellow pine let into the sills and plates with tenons. The first and third side posts at each end are reinforced with ⅓ in. × 2 in. × 2 in. angle irons, flanged to form angles against the sills and plates. Side posts are ploughed out to receive ⅝ in. vertical tie rods, shown in Fig. 1. End posts are similarly reinforced by angle irons and held by tie rods. Corner and door posts are of poplar fastened to body posts with 3½ in. countersunk screws. The arrangement of lintels, belt and panel rails, window sills, braces, etc., is plainly shown in Figs. 2 and 3.

All spaces between side and end posts except doors, windows and under letter boards have a ⅞ in. filling of white pine fitted into rabbets in posts. The sheathing is ¾ in. poplar tongue and grooved boards.

The roof is made of tin and galvanized iron. Deck and window sashes are mahogany ¾ in. thick. The end doors are different in the storage and distribution ends of the car, the one at the distribution end being only 2 ft. 5⅛ in. high and opening under the letter case, while at the storage end it is 6 ft. 4¼ in. high with glass windows as usual.

Fig. 4 is a half side elevation; Fig 5 is a plan showing the arrangement of the interior. The letter cases are made of ash with brass wire bottom to the pigeon holes. The distribution table at the letter cases is cherry 17 in. wide all round, and having a rubber cancelling pad. The distribution table at the sack racks is also cherry, 23 in. wide, made in two parts, hinged, the outer part 14 in. wide turning back over the stationary. The storage poles are ash 2½ in. in diameter set in cast-iron sockets, The arrangement of the clothes locker, water cooler. heater, etc., is plainly shown in Fig. 5.

Drawings of the six-wheel trucks are given in Fig. 6. They are of the swing bolster type with 33 in. Paige steel tired wheels, and steel axles with 4¼ × 8 in. journals. The journal boxes are fitted with Morris pressed steel lids. All the wheels are braked, the B. & O. plated wooden brake beam being used on the outside pairs of wheels, and the Westinghouse iron brake beam on the inside pair. The Cristie head is used on both beams. The truck is shown so well by Fig. 6 that no detailed description will be given.

Buffalo & Susquehanna Consolidation Locomotive.

The engraving shown herewith illustrates an eight-coupled consolidation locomotive recently built by the Baldwin Locomotive Works, Philadelphia, for the Buffalo & Susqehanna Railroad. This engine weighs over 80 tons and has 147,000 lbs. on the drivers. The principal dimensions are as follows:

Gage	4 ft. 8½ in.
Kind of fuel to be used	Soft coal
Weight on drivers	147,000 lbs.
" " truck wheels	16,000 lbs.
" Total	163,000 lbs.

General Dimensions.

Wheel base, total, of engine	21 ft. 10 in.
" " driving	13 ft. 5 in.
Heating surface, firebox	189.5 sq. ft.
" " tubes	2,055 sq. ft.
" " total	2,244.5 sq. ft.
Grate area	35.3 sq. ft.

Wheels and Journals.

Drivers, number	8
" diameter	51 in.
Truck wheels, diameter	30 in.
Journals, driving axle, size	8½ in. × 10 in.
" truck " "	5 in. × 9½ in.

Cylinders.

Cylinders, diameter	22 in.
Piston, stroke	26 in.

Boiler.

Boiler, type of	Straight top
" working steam pressure	180 lbs.
" material in barrel	Homogeneous cast steel
" thickness of material in barrel	⅝-in.
" diameter of barrel at smokebox end	72 in.
Seams, kind of, horizontal	Butt jointed with double covering strips
Thickness of tube sheets	½-in.
" crown sheet	½-in.
Crown sheet stayed with	Radial stay bolts

Tubes.

Tubes, number	260
" material	Iron
" outside diameter	2¼ in.
" length	13 ft. 6 in.

Firebox.

Firebox, length	10 ft. 1 in.
" width	3 ft. 6 in.
" material	Homogeneous cast steel
" thickness of sheets, sides and back	⅜-in.
" water space, width	Front, 4 in.; sides, 3 in.; back, 3 in.

Tender.

Weight, loaded	90,000 lbs.
Water capacity	4,000 gals.

The frames are 4 in. × 4¼ in. All the springs are A. French & Co.'s. Jerome metallic packing is used for the piston rods as well as for the valve stems and the air-pump. There are two Friedman monitor injectors. Detroit triple automatic sight feed lubricators are used both for the cylinders and the air-pump. The brass work in the cab is nickel plated. The engine has front and back sand boxes and the Leach sanding apparatus. The headlight is to project beyond the front of the smokebox, after the fashion of the new class P locomotives of the Pennsylvania The American steam brake is used on the driving wheels, the Westinghouse air-brake on the tender (with a 9½-in. pump) and the cylinders are equipped with connections for the Le Chatelier brake. There is a common bull-nose coupler on the pilot and a Janney coupler at the rear of the tender.

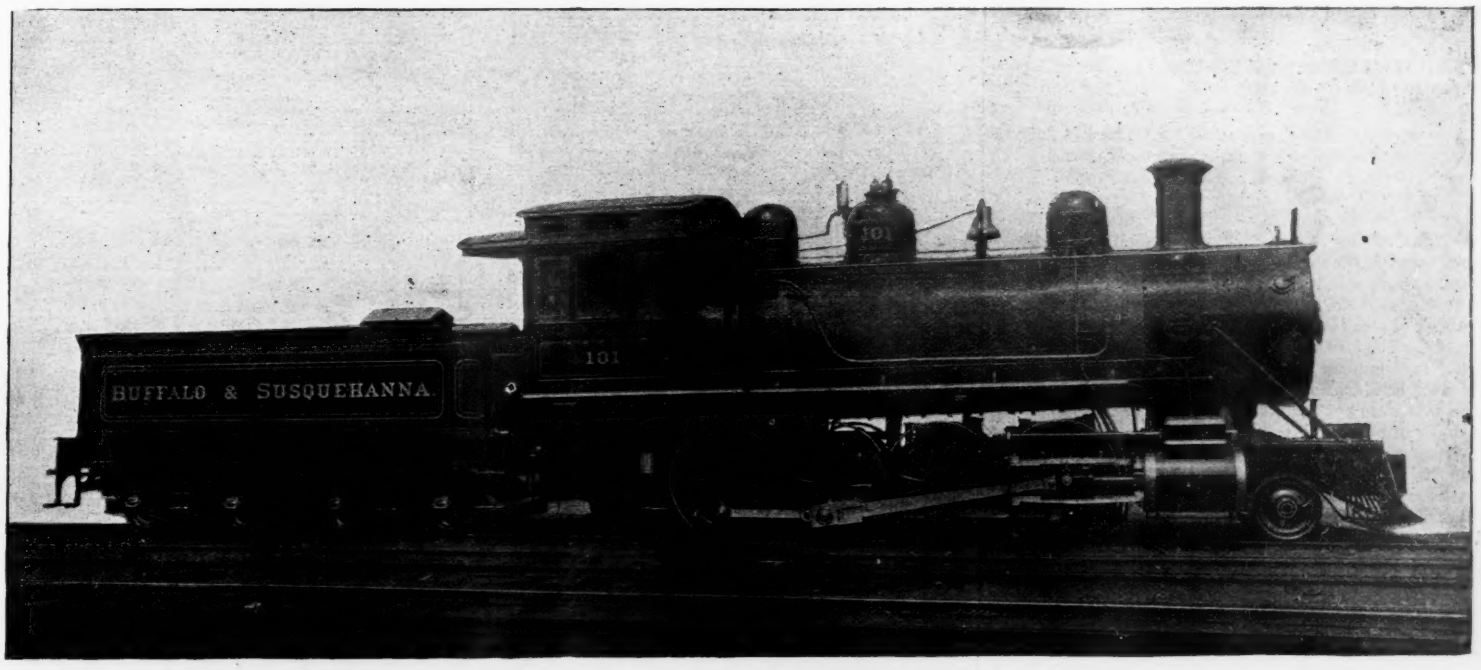
PERFORMANCE OF FREIGHT ENGINES—EAST LACROSSE DIVISION—JUNE 28 TO AUG. 3, 1895.

Engine 2427 Richmond compound; engine 827 Baldwin compound; others simple.

Rank.	Engine Number.	Engine miles.	Ton miles.	Pounds coal per 100 tons one mile.	Average weight train tons.
1	827	3,378	2,657,738	10.28	786.8
2	2,427	2,222	1,862 451	11.51	838.2
3	638	3,230	2.116,135	11.82	748.0
4	698	3,170	2 480,420	12 11	782.4
5	643	3,330	2,593,568	12.29	780.0
6	823	3,375	2,631,721	12.32	780.0
7	671	8.396	2,690,021	12.92	792.1
8	814	2 696	2,142 974	12.93	794.9
9	822	2.062	1,483.712	14.08	719.7
10	826	3,038	2,317,040	14.23	762.6
11	819	2.032	1,382,072	14.24	680.1
12	825	2,036	1 300,171	14 55	639.1
13	818	3,066	2,256,650	14.86	736.0
14	821	2,412	1,895,013	15.85	785.7
15	754	2,782	2,171,873	16.66	781.0
Av'age		2.815	2,152,104	13.38	760.4

Summary.

Engines.	Engine miles.	Pounds of coal.	100 ton miles.	Pounds coal per 100 ton miles.	Av'ge weight of train	Saving.
Thirteen simple engines	36,625	3,831,701	277,614	13.80	9,781	
Average	2,817	294,746	21,355	13.80	752.4	
Baldwin compound	3,378	273,215	26,577	10.28	786.8	25.5
Richmond compound	2,222	214,362	18,624	11.51	838.2	16.6



Consolidation Locomotive, Buffalo & Susquehanna Railroad.

Built by THE BALDWIN LOCOMOTIVE WORKS, *Philadelphia.*

Comparative Locomotive Performances.

In several previous issues of the *Railroad Gazette* has been noted the good performance of the Richmond Locomotive Works' "tramp" compound No. 2427 on different roads, and we are now able to give a detailed report of the trial on the Chicago, Milwaukee & St. Paul railroad. The conditions of this test approximated as near as possible to actual service, and with this in view No. 2427 took a number of local trains, the weight of these trains not always being sufficient to load the engine enough to get its maximum economy. This makes the showing more valuable since the results of the test show what can be done year in and year out.

Another condition against No. 2427 was that it was not designed especially to meet the requirements of service on the Chicago, Milwaukee & St. Paul road, while the engines with which it was compared had been developed in design and detail through years of experience to suit the local conditions. The scale in the boiler had not been removed for over a year while the engine was running about the country, and the grates and front end were not exactly suited to the grade of coal used. The following table gives the results of the tests in detail:

It will be seen that the Baldwin compound stood first, which is natural as its design is similar to the other St. Paul engines. The two compounds beat the simple engines singly and collectively and the choice of them is only a question of mechanical preference considering the point of simplicity and durability. The simple engines figure out an average mileage of 28,170 miles per year and the demonstrated saving of 16.6 per cent. would mean about 245 tons of coal saved in a year. At the price of $2 per ton for coal the saving would amount to $490 for each engine per year. Engine No. 2,427 is now at the Atlanta Exposition.

Government Railroad Statistics for 1894.

The statistics of the railroads of the country for the year ending June 30, 1894, gathered by the Interstate Commerce Commission, have reached their second public stage. The first stage was that represented by the telegraphic summary sent out by the press associations last June, which was about 11 months after the date to which the figures are made up; now we have the full report of Statistician Adams (the seventh annual report), but without the six tables which make up the great bulk of the completed volume. The pamphlet issued now, containing about 100 pages, comes unbound, as an advance copy. The third and final stage will be reached when the complete bound volume comes out. When this will be, depends, probably, on the exigencies of work at the Government Printing Office.

This report is now quite full, and is the result of a prodigious amount of work on the part of the Statistician and his assistants. It is unfortunate that it is not possible to lay it before the public at an earlier date. Statistics concerning cars and engines; train brakes and automatic couplers; employees, classified by occupation; capitalization, traffic statistics, earnings and expenses; general balance sheets and accident statistics are tabulated in great detail, and nearly all of these tables are sub-

divided, according to the ten geographical groups into which the Statistician divides the country. There are five short tables made up especially to illustrate the effects of the business depression on the railroads.

We append some of the more interesting statistics which did not appear in the summary given out in June (*Railroad Gazette*, June 21, page 402):

	1894.	1893.
Employees per 100 miles of line	444	513
Average daily compensation, general officers	$9.71	$7.94
Average daily compensation, station agents	1.75	1 83
Average daily compensation, engineemen	3.61	3 66
Average daily compensation, laborers	1.65	1.70
Passengers carried one mile, millions	14,289	14,329
Passenger mileage per mile of line	81,333	83,8 9
Ton mileage, millions	80,335	93,588
Ton mileage per mile of line	457,252	551.232
Passenger train mileage, millions	326 5	335.6
Average passengers per train	44	42
Freight train mileage, millions	446.8	508.7
Average train load, tons	179.8	184 0
Average haul, miles	125.9	125.6
Number of employees to each one killed	4?8	.....
Number of employees to one injured	33	.....
Number of passengers to one killed	1.668,791	...
Passenger mileage to each pas'ng'r killed	44,103,228	.....

As noted in the foregoing table, the pay of general officers (and of general office clerks) increased from 1893 to 1894, but the pay of all other grades fell off a little, though brakemen and telegraph operators did not fall below the rates they received in 1892.

The report contains nine graphical diagrams, showing the ratio of stock to bonds; proportions of stock and bonds not paying dividends or interest; passenger, freight and gross earnings; operating expenses; fixed charges and dividends; density of passenger traffic; density of freight traffic; average receipts per passenger and ton mile, and percentage of cars and engines fitted with power brakes and automatic couplers.

Statistical Diagrams of the Interstate Commerce Commission.

The seventh annual report of Mr. Henry C. Adams, Statistician of the Interstate Commerce Commission, which is reported above, contains nine graphical diagrams, five of which we reproduce herewith. While these diagrams add little to the information shown in the text of the report, they greatly facilitate comparisons between the different geographical groups, and it is for this purpose, chiefly, that we show them.

In diagram No. 2 the heavy black lines show the proportion of stocks not paying dividends for the years 1890 to 1894. The lowest percentage, about 22, is for Group 1 in 1894. Diagram No. 3 gives similar information concerning bonds. For the years omitted on this diagram the data were not compiled. Diagram No. 6 shows the density of passenger traffic. The percentages indicated by the figures at the top of the table are derived on the basis of the ratio of the several items (representing passenger miles per miles of line) in the right hand column of the diagram, to the density of passenger traffic in Group 1 (New England) for 1893, that being taken as 100 per cent.

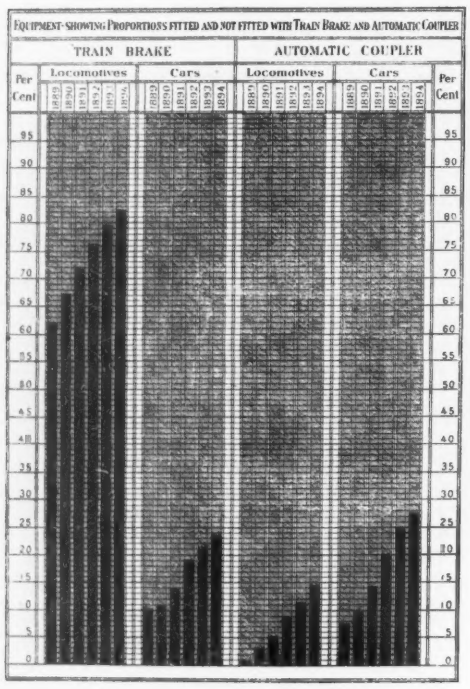


Diagram No. 9.

Diagram No. 7, for traffic freight, is made up in the same way, the 100 per cent. item in this table being that for Group 2 (Middle States and Maryland) for the year 1892. In diagram No. 9 the black lines show the proportion of cars and engines fitted with safety devices. It is to be remembered that all of these diagrams are now 15 months old. This point is especially important in the last (No. 9), the number of cars equipped with brakes and couplers having been very large during the last year as compared with the total number equipped up to the beginning of that period. In all the diagrams the group statistics are less complete—that is, cover fewer years—than those for the whole country.

Some Details of Railroad Discipline.*

Disciplinary action should be frequently bulletined upon the official boards. In doing this, names should never be mentioned, but the parties concerned should be impersonally referred to as "A freight conductor," "A passenger brakeman," "A section foreman," etc. and the offense calling for discipline should be briefly described. In the case of an infraction of any general rule or special order, it is better to merely give the number of the rule or the date of the order, because in the search for the text of the rule or order, which always follows a bare announcement of this kind, other matters are liable to be freshened to the benefit of the searchers after information. In addition to bulletining, a copy of the official notice should be sent to each member of the class of employment to which the offender belongs.

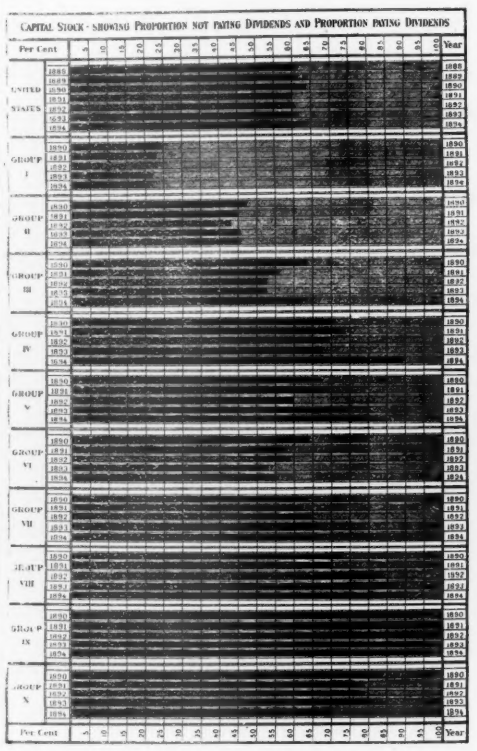


Diagram No. 2.

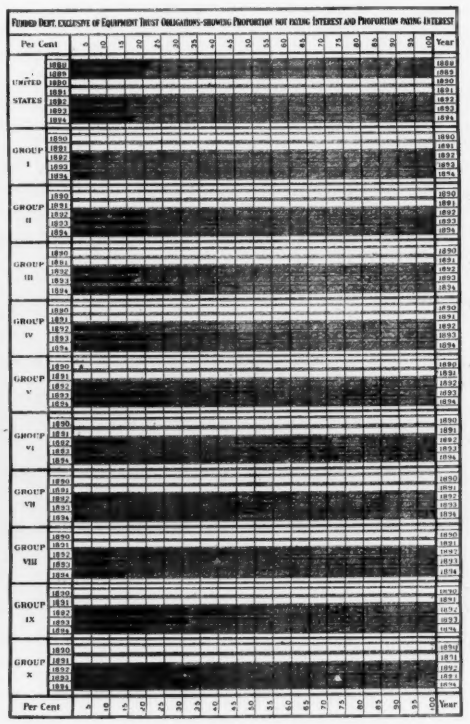


Diagram No. 3.

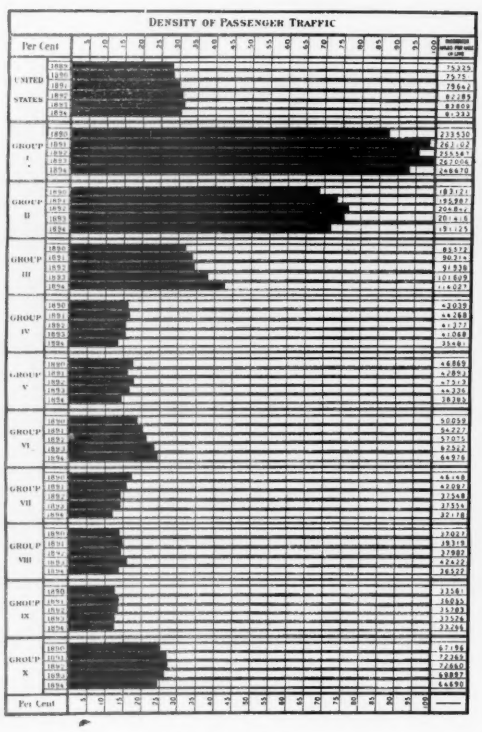


Diagram No. 6

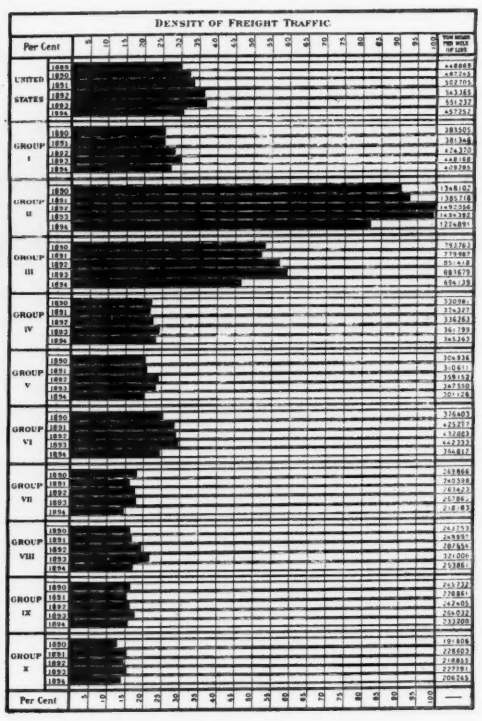


Diagram No. 7.

Statistical Diagrams of Interstate Commerce Commission, 1894.

Agents, foremen, conductors and engineers should each be furnished with a scrap-book in which to keep on file not only notices of this kind, but notices and orders pertaining to all subjects as to which they may be interested or may be liable to receive notice. Once or twice a year there should be an inspection of scrap-books. All possible publicity given in this way to disciplinary proceedings is of the highest importance and value, not only for the purpose of correcting wrong impressions that might otherwise become current as to the findings in such cases, but with the object, as before stated (and I may say, according to personal observation, with the apparent effect), of reducing the chances of the same action being required in the near future.

A service record should be kept, if not of each employee, then at least of each conductor and engineer. A record of this kind, begun about five years ago, is now proving its value to the writer as a means of arriving at correct judgment in questions of conduct and service, as compared with the unassisted memory. To make such a record complete and valuable, all instances of exceptional good conduct as well as of error should go into it; and in considering any case calling for discipline, it is the best policy as well as plain justice to give due weight and credit to these examples of fidelity in arriving at a decision. It cannot be too strongly impressed upon the minds of all concerned that the building up of a good record against a time of trouble is as sensible a proceeding as the accumulation of dollars in a savings bank against a rainy day.

Presidents and other officers of high rank cannot render a more valuable service to their corporations than by discouraging that spirit of martinetism which is the natural outgrowth of the power that rests in the hands of operating officers in immediate command of men. Officers should cultivate knowledge of and kindly interest in the men who are fellow-members of the railroad family. With such a reputation fairly gained, the power of a man in command of men to secure the respect and obedience of his subordinates is very great. In the troublous times that come to our business we sometimes see an officer of this stamp, maintaining order and transacting business when wheels are at a standstill all around him.

The history and traditions of the railroad business furnish abundant testimony to the fact that a compound of 50 per cent. of strictness and 50 per cent. of kindness produces the best results in handling men. The examples of Thomas A. Scott and J. H. Devereux and of Thomas J. Potter, show what this practice of strictness without tyranny, and of kindness without laxity, can accomplish. We of a younger generation need not be ashamed to sit at the feet of those masters in the art of handling men, and learn what is taught us by the records they have left behind them—not only such records as are writ in books, but also those that are graven in the hearts of men, still living, who served under their command. Scott and Devereux and Potter were strict and unyielding executives, but they never failed to show justice to

*Extracts from a paper read before the Buffalo Superintendents' Association by Mr. C. B. Price, of the Allegheny Valley Railroad.

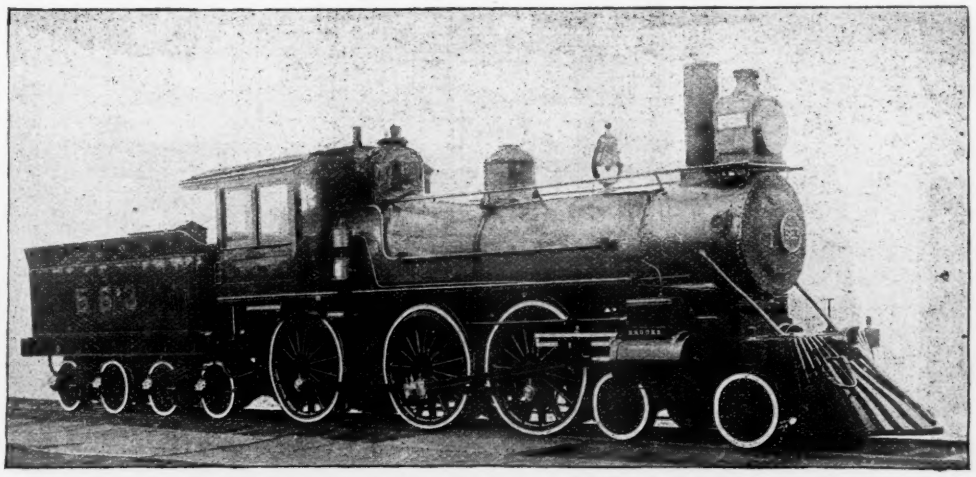
those whose every day religion was fidelity; and when the evening shadows fell upon them, and they sat in the cool twilight of life's closing hours, the most restful thought that came to them may have been the consciousness that they had won the hearts of those faithful subordinates with whom they had borne the heat and burden of the day.

Lake Shore Ten-Wheel Passenger Engine.

Engine No. 564 of the Lake Shore & Michigan Southern, which hauled the fast train of Oct. 24 from Erie to Buffalo, is a 10-wheeler, weighing only 56¾ tons, and with cylinders 17 × 24 in. The remarkable performance of this engine, as noted in another column, makes it of special interest, and we append the following description of it. The photograph shown herewith is of engine No. 563, another one of the same class, built at the same time (1891).

DESCRIPTION OF 10-WHEEL PASSENGER LOCOMOTIVES, CLASS 17 D.

Gage	4 ft. 8½ in.
Fuel	Bituminous coal.
Cylinders, diam. and stroke	17 in. × 24 in.
Driving wheels, diameter	68 in.
Rigid driving wheel base	8 ft. 6 in



Ten-Wheel Passenger Engine, Lake Shore & Michigan Southern Railway.

Built by the BROOKS LOCOMOTIVE WORKS, *Dunkirk, N. Y.*

Total driving wheel base	15 ft.
Total wheel base of engine	25 ft. 3 in.
Total wheel base of engine and tender	48 ft. 8 in.
Weight of engine in working order	113,500 lbs.
" " on truck	25,000 lbs.
" " " drivers	88,500 lbs.
" " tender loaded	73,000 lbs.

Boilers.

Type	Crown bar wagon top
Working pressure	180 lbs.
Material and thickness	Steel, 7/16 in., 1/2 in. and 7/16 in.
Diameter at smoke box	62 in.
Tubes, number and diameter	202, 2 in.
" length	12 ft. 10 in.
Firebox, inside	93 in. × 42 in.
" depth, front and back	64 in. and 50 in.
Heating surface, firebox	145 sq. ft.
" tubes	1,462 sq. ft.
" total	1,603 sq. ft.
Grate area	28 sq. ft.
Tube opening	3.6 sq. ft.

Machinery.

Cylinder packing	Dunbar
Valves, lap outside	1 in.
" " inside	3/8 in.
" lead in full gear	3/16 in.
Travel, maximum	6 1/8 in.
Driving wheel journals	7½ × 9
Truck wheel journals	5 in. × 10 in.

These engines have a brick arch in the firebox, carried on three water tubes 2½ in. in diameter. The longitudinal seams of the boiler are quadruple lap without welt, and the circumferential seams are double lap. The tubes are made of charcoal iron. The crown sheet is arched 1½ in. laterally in the center. The exhaust pipe is high (double) with a deflector in front of it. The valves are of the Allen-Richardson pattern as made at the Brooks Works. The driving wheel tires are of Midvale steel with Mansell retaining rings. The front truck wheels are of paper 33 in. diameter. The tender wheels are also of paper 36 in. in diameter with journals 4 in. × 7 in.

Suspension Bridges.*

BY LEFFERT L. BUCK, M. AM. SOC. C. E., *Chief Engineer New East River Bridge.*

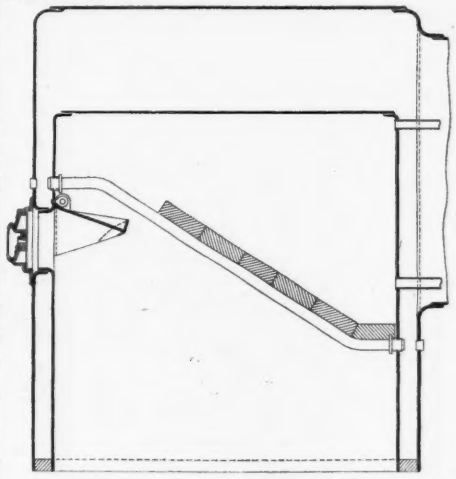
(*Concluded from page 709.*)

Ordinarily the span of the suspension bridge is too great in proportion to the width of the floor to admit of bracing it laterally, as in the ordinary truss bridge. In this case, there must be lateral stays securing the truss system against lateral movement from wind. They must be ample for the purpose, as they are just as important as any portion of the structure.

Well designed trusses, especially for heavy railroad suspension bridges, will be ample to resist vertical undulation from wind. But it would be expensive in a long, narrow bridge to attempt to make them stiff enough laterally to resist high winds. It is better to use the stays in that case. At the same time, you will require lateral bracing to keep the trusses in line, as well as for partial wind pressure. You will consider the stress they bring upon the chords. And do not take any chances with the stays. Be sure that they have the requisite strength, and that the fastenings are amply strong ro develop the full strength of the stay. Bridges have been lost by inattention to proper security of stays. It is best to adjust the stays in cold weather.

It has been urged against the suspension bridge that it takes so long to build the cables and that, as this cannot be commenced till the anchorage and towers are completed, if it is to be a very great structure, the interest of the money invested, for which no returns can be received till the bridge is done, must make the bridge more costly than any other form. I believe it to be possible to build a large suspension bridge just as quickly as any other bridge of equal capacity and span. There is no reason why the manufacture of the strands should not be carried on at the same time that the masonry is being built. With comparatively small expense sufficiently strong towers could be constructed on which to lay up a strand at a time. In this way the strands could all be made up by the time the regular towers are ready. All that would then be necessary would be to run the strands over the towers, adjust their deflection, secure them to the anchor chains, grip or band them, put on the covering and suspenders, and hang the suspended structure to them. No man worthy to be considered a bridge engineer need let such a reason deter him from adopting the suspension principle, provided that that is his only objection.

There are numerous works that treat of the suspension bridge, and some of them very thoroughly. But it is best for the engineer to work out his problem in his own way. He may receive valuable suggestions from such authors, and he should by no means neglect getting all the information possible, but he must study his problem for himself. He must study it thoroughly, letting not the slightest detail escape his careful attention. The engineer, who is not willing to do that on any work he has in hand, may accidentally escape failure, but he is not worthy of success.



"Smoke-Consuming" Apparatus, P., C, C & St. L. Ry.

It is only by careful attention to all details that improvements are made.

Do not jump at the conclusion that any given form of bridge is the best, till you have thoroughly investigated all of the conditions of your problem, both financial and practical. You may have to decide against your own wishes. If so, do it. Then, when you have decided upon what form to use, go ahead with it, and if you have been faithful to yourself and your employer, you will succeed. If you find that the suspension bridge is best adapted to the conditions, build it. There is no better form of bridge than a well built suspension bridge. But if you are content to follow some beaten track, in building upon some plan that was used forty or fifty years ago, while other forms of bridges have been making great advancement, you will surely fail, and had better not try it. Nobody can give a general rule to apply to all cases. You must and should work that out for yourself. On a large structure you will find time for carefully studying every step.

At the time Roebling was building his Niagara railroad suspension bridge, Stevenson was building his tubular bridge at Montreal. One can scarcely conceive of two structures more widely different. We might say that, in a sense, they were at the opposite extremes. Probably there was the same difference between the men themselves. They were both intensely in earnest. Each believed that he was working on the correct principle, and that the other was wrong. That the works of both men are still in service, is to be ascribed to the fact that both men were in earnest, more than to their intimate knowledge of the stresses to which their structures would be subjected. There is now no question as to which was the better plan.

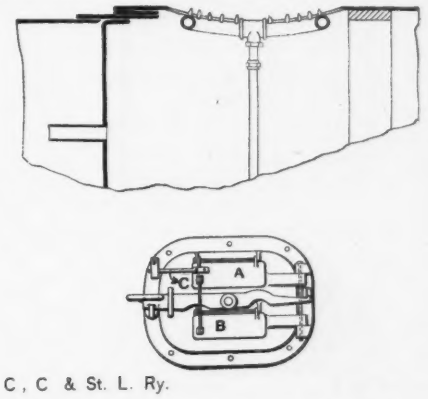
Mr. Roebling knew what the cables would have to do, and he spared no pains to make them good for their work. In one respect, perhaps, "he builded better than he knew." He gave his cables a factor of safety of six or seven, while a factor of safety of four for a structure of that length would have been sufficient at that time. This is due to the fact that a long tension member has a much greater resisting power against a suddenly applied load than a short one of equal strength per square inch, as is shown by experiment. A wire six feet long was secured by one end to a rod fifty feet long. The rod was suspended vertically, with the wire at the lower end. The lower end of the wire had a washer attached to it. A fifty-pound weight, with a hole through it, rested on the washer, and was raised up and allowed to fall several times from gradually increasing heights. When falling from a height of six feet it broke the wire. A wire a hundred feet long, with a washer at its lower end, was suspended in the same manner, and the same weight did not break the wire till it had fallen thirty-six feet. Yet the wire was of the same piece as the shorter one. Its greater resistance was due to the fact that its greater elongation gave it more time in which to arrest the motion of the falling weight. It is on this account that a smaller factor of safety on the cables of the Niagara bridge would have been safe at the time they were built. And it is on this account that they safely sustain greater loads every day than the test load which Mr. Roebling subjected them to forty years ago.

The long suspension bridge has another advantage over the short bridge, in that the maximum load is longer in coming on the long bridge. Then greater care is usually expended in the construction of the long, heavy bridge than in the short one; and for all these reasons it is proper to increase the unit stresses by some ratio of the increased span, depending upon the weight and importance of the structure.

You can never be certain that you have the best design that you can make for a structure, till you put it to the test by a complete design; and in doing so, be your own good enemy, and fight yourself at every step, with a determination on both sides to win if you can. Let not the slightest detail escape your careful attention. In starting, you must, of course, select the general arrangement which promises the best results. Then go for it. If it will not stand the test, drop it, and try another plan.

Finally, listen to the advice of any experienced man; but remember that he may be mistaken. You must work at your problem honestly. Be enthusiastic, but control your enthusiasm. Court success as you would court the woman you would make your wife. Success is gratifying in proportion to the amount of work necessary to gain it.

There is no more durable bridge than a well built suspension bridge, and there is no more enduring reputation than that of the man who will sometime in the future build one of large size as it should be built.



Smoke Prevention on the Panhandle.

Several locomotives of the Pittsburg, Cincinnati, Chicago & St. Louis have recently been equipped with devices for decreasing the amount of black smoke emitted from the stack while the engines are working in yards, and we publish herewith drawings of the firebox and smokebox, showing the arrangement of the several devices. The brick arch, supported in the usual way by water bars, is carried well back toward the rear of the firebox. The deflector on the inside of the firebox, above the feed door, is made of cast-iron, and is secured at the top by means of a bolt and hinges. Attached in this way it can be quickly taken down when necessary, and may be

* Extracts from a lecture delivered before the students of the Rensselaer Polytechnic Institute. Reprinted from the *Polytechnic.*

turned up out of the way whenever it is necessary to go into the firebox through the door.

The fire door has two openings covered with small auxiliary doors, *A* and *B* Fig. 1, to be opened for the purpose of admitting a limited amount of air above the fire. These small doors hang on horizontal hinges, and when the main door is closed the arm *C* strikes a boss on the fire door frame which acts as a stop and insures that whenever the main door is closed the smaller ones shall be opened a certain distance. When starting a new fire in an engine the small doors may be kept shut by turning the stop out of the way.

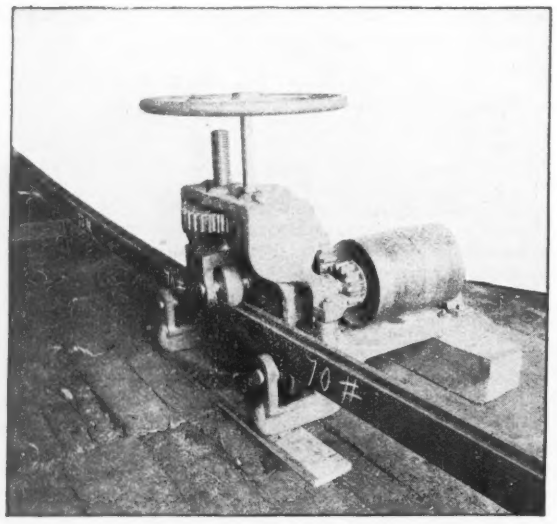
There are washout plugs in the outer firebox sheets opposite the ends of the water pipes supporting the brick arch. These make it easy to keep the arch pipes thoroughly clean.

To further assist in the suppression of smoke the blower admitting steam into the stack has an annular pipe with small openings, as shown in Fig. 3, by which numerous small steam jets can be thrown upward so as to mix with the smoke, making the latter somewhat less objectionable.

The officers of the road inform us that these devices have been effective in mitigating the smoke nuisance, though they do not discover any saving in fuel.

Smith Rail Bending Machine.

We illustrate herewith a patent rail bending machine recently used in the construction of 60 miles of the Quebec Central Railroad. The machine is operated by steam or other power by means of a belt run around the pulley shown in the cut, instead of by hand, the rail being fed through in the manner shown and the curvature regulated by varying the pressure of the middle roller. This is done by turning the large wheel shown above the center of the machine. There is a gage attached to the



Smith Rail-Bending Machine.

screw seen on the left of the regulating wheel, by which the degree of curvature is calculated.

The machine is designed not only for street and steam road rails, but for bending iron work for bridges and other structures. It being stationary, and the feed continuous, a uniform bend or curvature is secured. The supporting frame and its bed is solidly built and the machine when used is firmly fixed on a suitable foundation at a convenient location. The machine is manufactured by George E. Smith, of Sherbrooke, P. Q., and was exhibited at the convention of the American Street Railway Association in Montreal last week.

Lake Shore Eight-Wheel Passenger Engine of 1893.

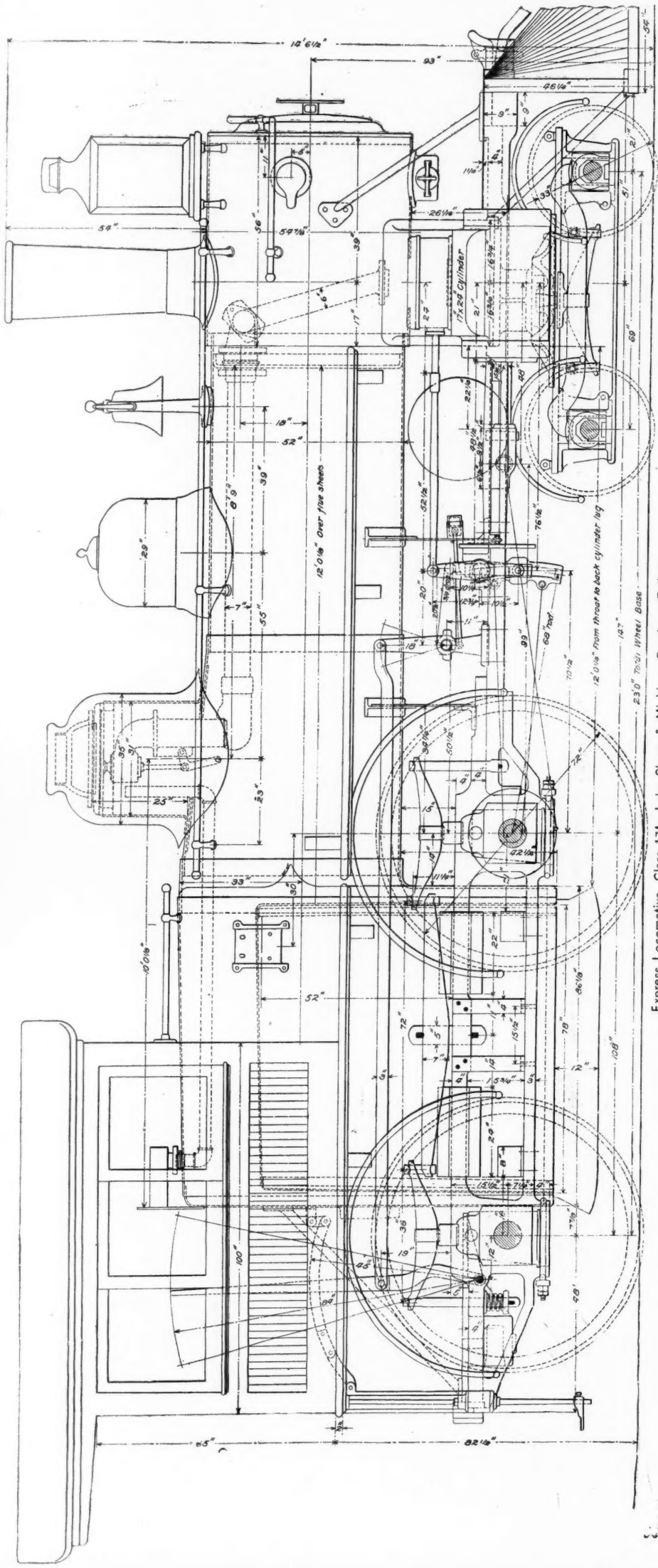
The engines which drew the fast train over the Lake Shore & Michigan Southern on Oct. 24 from Chicago to Erie were all of Class 17 A, which was designed by Mr. Stevens in 1893 for the Exposition Flyer. One of these engines, No. 599, was illustrated in the *Railroad Gazette* of June 2, June 9 and June 23 of that year, and we reprint herewith the drawing showing the side elevation of the engine, and the principal

DIMENSIONS.

Cylinders	17 × 24 in.
Drivers, diam	72 in.
Wheel base of engine	23 ft. 9 in.
Driving wheel base	9 ft.
Total wheel base of engine and tender	45 ft 8 in.
Weight of engine in working order	104,600 lbs.
" " " on engine truck	39,500 lbs.
" " " main drivers	33,100 lbs.
" " " back drivers	32,000 lbs.
" tender loaded	70,000 lbs.

Boiler.

Working pressure	180 lbs.
Waist, diameter at smoke box	52 in.
" " " throat sheet	60 in.
Tubes, number 200; diam	2 in.
Tubes, length	12 ft.
Firebox, inside	78 × 34 in.
" depth, back	79 in
" " front	81 in.
Heating surface, firebox	155 sq. ft.
" " tubes and arch pipes	1,258 sq. ft.
" " total	1,413 sq. ft.



Express Locomotive, Class 17A—Lake Shore & Michigan Southern Railway.

Mr. G. W. Stevens Superintendent of Motive Power. Built by the Brooks Locomotive Works, Dunkirk, N. Y.

Machinery.

Steam ports	1⅝ × 16 in.
Allen port in valve	16 × 5/8 in.
Bridges	1⅜ in.
Exhaust port	3 × 16 in.
Valve ports	⅝ × 16 in.
" lap outside	1 in.
" lap inside	3/32 in.
" lead in full gear	1/4 in.
" travel, maximum	6⅛ in.
Eccentric travel	5 in.
Driving axle journals	7½ × 9 in.
Frames, forged solid	3¾ × 4½ in.

The Rowell-Potter Automatic Signal and Safety Stop.

The engravings printed herewith show the apparatus and method of operation of the Rowell-Potter "safety-stop" as it is used on the South Side Rapid Transit Company's elevated railroad in Chicago, and as it will soon be put in operation on the Metropolitan West Side elevated railroad in the same city. This is essentially an automatic block system, operated by a lever which is actuated by the wheels of passing trains, with an additional arrangement for automatically applying the air-brakes on any engine that overruns a signal which is set at danger. The apparatus can be used either with or without a visual (semaphore) signal. Where a semaphore is used the power for moving the arm up and down is furnished by a weight and springs, the weight being lifted and the springs compressed by the pressure of the wheels of a passing train upon a lever.

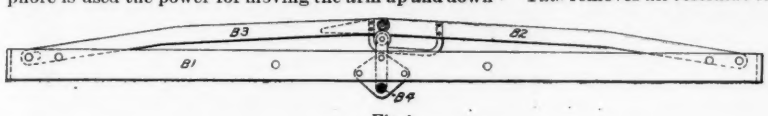


Fig. 5.

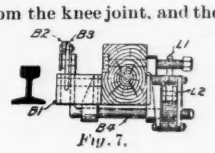


Fig. 7.

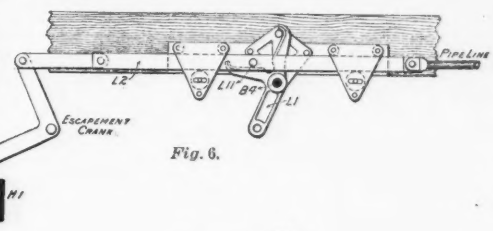


Fig. 6.

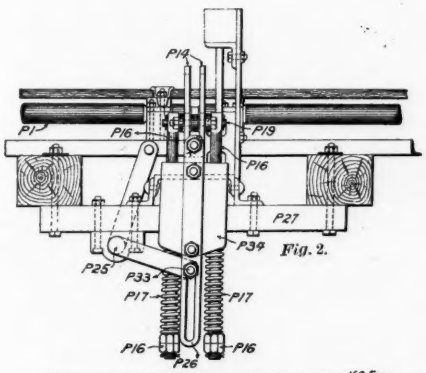


Fig. 2.

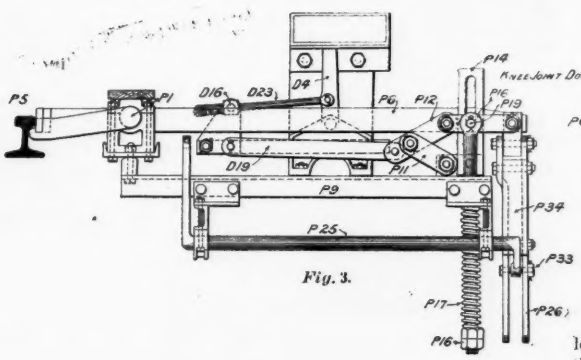


Fig. 3.

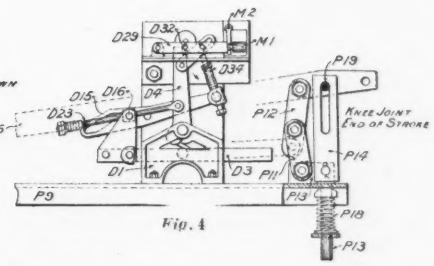


Fig. 4

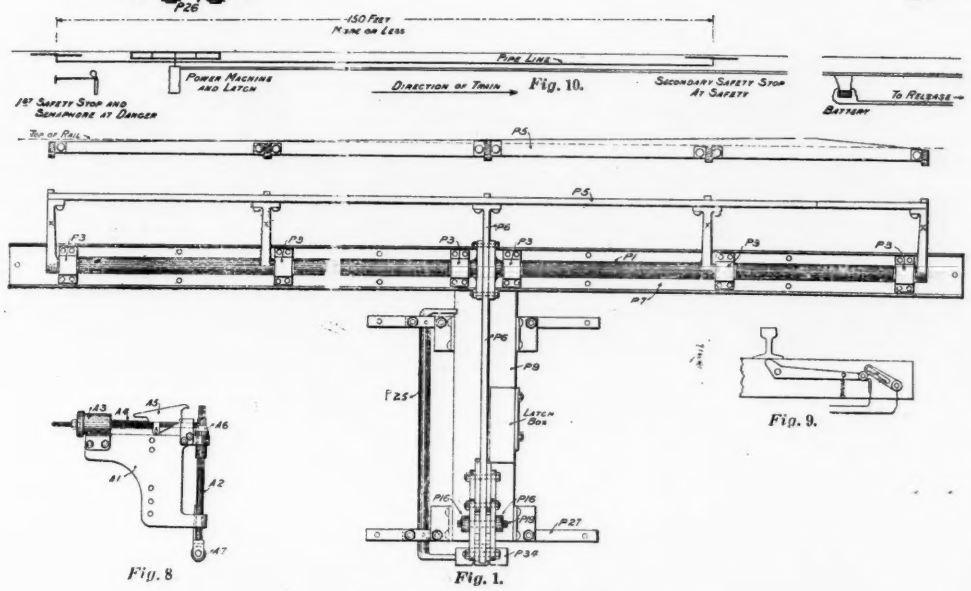


Fig. 10.

Fig. 8

Fig. 1.

Fig. 9.

The Rowell-Potter Safety Stop.

Fig. 1 is a plan view of the power machine. Fig. 2 is an end view of the power lever, showing counterweight, spring cushion and signal rockshaft connections. Fig. 3 is an end view of power machine, showing front of power lever and latch. The tread bar is raised above the rail in a position to be depressed by the wheels of a passing train; the knee joint is in the lowered position ready to be raised or straightened, and the link connection between knee joint and latch bar.

Fig. 4 is the same apparatus as Fig. 3, but shows details of latch construction and the knee joint in the raised position. Fig. 5 is the safety stop track instrument. Fig. 6 is the escapement crank and connections which operate the signal and safety stop rockshaft. Fig. 7 is an end view of Fig. 6 showing the relative position of the safety stop to the rail. Fig. 8 is the brake-setting attachment as applied to locomotives.

Fig. 9 shows the electric contact operated by the deflection of rail. Fig. 10 shows a general plan of the signal. The arrow indicates the direction in which trains move.

In Fig. 1, *P* 1 is the rockshaft to which tread bar *P* 5 is attached by the several arms *X*. The power lever, *P* 6, being rigidly connected to rockshaft *P* 1 and extending to tread bar *P* 5, serves as one of the arms *X*. Tread bar *P* 5 being depressed by the wheels of a passing train, it rotates the shaft and raises the outer end of power lever *P* 6, to which is attached counterweight *P* 34 (Figs. 1 and 2). This raises the weight and compresses spring cushion *P* 17 (Fig. 2).

The power lever in raising, straightens knee joint *P* 11 and *P* 12 (Fig. 3) and draws latch bar *D* 3 (Fig. 4), first towards it, or into the position shown in Fig. 4. The latch bar *D* 3 in traveling forward, compresses spring, *D* 34 through the cam slot in lever *D* 15, thereby storing energy to lift lockbolt *D* 32 for the purpose of releasing lever *D* 4 when the magnet armature is attracted. The latch bar being drawn forward, is caught and held in that position by the dog in the lower end of lock lever *D* 4 (shown in Fig. 4). To release latch bar *D* 3, lock lever *D* 4 must tip to the right. This can only be done by magnet *M* 1 attracting its armature *M* 2, causing it to release its hold on lever *D* 29. This is then lifted by spring *D* 34, and in turn raises lock bolt *D* 32, which releases the upper end of lever *D* 4, and allows it to tilt forward in the direction of the arrow.

This removes all restraint from the knee joint, and the pressure of counterweight *P* 34 and cushion springs *P* 17 (Fig. 3) causes it to collapse, and through the medium of link *D* 19 (shown in Fig. 3), carries latch bar *D* 3 into the position shown in Fig. 3. Latch bar *D* 3 by means of trunion *D* 16 and relocking rod *D* 23, restores lock lever *D* 4 to its locked or normal position, as shown in Figs. 3 and 4. Through the operation of the power machine by the wheels of a passing train, as described, counterweight *P* 34 is raised off rockshaft *P* 25 (Figs. 1, 2, 3), and the bolt *P* 33, which connects the counterweight to the rockshaft, slides through the slot in link *P* 26. The object of this slot is to allow weight to be raised without moving rockshaft. This removes all restraint from rockshaft *P* 25. Rockshaft *P* 25 is in turn connected to the pipe line controlling the safety stop and signal, and allows counterweight *H* 1 (shown in Fig. 6) to move the pipe line, which, through the medium of pin *L* 11, and escapement crank *L* 1, rotates rockshaft *B* 4 (Fig. 7), setting signal and safety stop to danger, and pulling secondary safety stop to safety.

Spring rods *P* 16 are attached directly to the power lever, as shown in Figs. 2 and 3, and are drawn up by it through channel bar *P* 27. The top of springs *P* 17 coming in contact with the lower side of channel bar *P* 27, and the lower end being confined by nuts on *P* 16, they are compressed as the rods *P* 16 are drawn upward, furnishing a cushion to prevent severe shocks to the apparatus, and at the same time storing energy to assist counterweight *P* 34 in returning the signal to the position of safety.

In Fig. 4 the spring rods *P* 16 are omitted for the purpose of more clearly showing the operation of the knee joint and its connections. *P* 13 is a cushion block forming the base of the knee joint.

P 14 is a link for limiting the stroke of power lever *P* 6, and *P* 18 is its spring cushion. The office of the link *P* 14 is to prevent the power lever from pulling the knee joint onto a dead center. It will be seen that both the link *P* 14 and knee joint *P* 11 and *P* 12 are pivoted to the head of spring rod *P* 13. When the pin *P* 19 in the power lever gets to the top of the slot in *P* 14, if the power lever should attempt to travel further in the upward direction it would lift spring rod *P* 13 against the pressure of spring *P* 18 and thereby prevent the knee joint from being straightened beyond the limit shown in Fig. 4.

In Fig. 1, *P* 3 are bearings which confine the rockshaft *P* 1 in place. *P* 7 is the channel bar foundation for the same, and *P* 9 is the foundation for latch and knee joint connections. In Fig. 5 *B* 2 and *B* 3 are a pair of toggle levers which when in raised position form the incline that operates the brake setting apparatus (shown in Fig. 8), and are raised and lowered by the rotating of rock shaft *B* 4.

In Fig. 8, *A* 1 is a plate which forms guides for the movable parts of the engine attachment. *A* 2 is a vertical rod adapted to be raised by the safety stop when in the position shown in Fig. 5. *A* 3 is the air valve, *A* 4 valve stem, *A* 5 automatic lock, *A* 6 combination cam and adjustment nut and *A* 7 friction roll or wheel. When A 2 in Fig. 8 is forced upward, valve stem *A* 4 is forced in a lateral direction by means of the cam nut *A* 6. Lock plate *A* 5 drops by means of gravity and the pressure of the spring shown on the valve stem, and locks the valve open; and it must be raised by the engineman before the valve can be closed.

In Fig. 10 the semaphore and first safety stop are at the entrance of the block, the power machine about 20 ft. in advance of the semaphore, and the second safety stop is about 150 ft. in advance of this. The same movement that sets the signal and first safety stop at danger, brings the second to safety, and vice versa.

For example: If the block is clear a train on approaching finds the semaphore and first safety stop at safety, the power machine in a position to be operated by the wheels of the train, and the second safety stop at danger. The first safety stop being at safety, the train passes over it unmolested, operates the power machine, which allows the signal weight to pull the signal and the first safety stop to danger and second safety stop to safety, and the train proceeds unmolested. On passing out of the block the train makes an electric contact, which releases the energy stored in the power machine. This, in turn, overcomes the counterweights of the signal and safety stop, carries them to safety and at the same time forces the second safety stop to danger. Thus, it will be seen, the signal failing to properly move will always be a danger signal. In other words, if the signal in either position is fastened so that it cannot move, it is a danger signal, and will stop every train that attempts to pass until put in working order.

Although the drawings have a somewhat complicated appearance, the construction of the apparatus is simple, and the manufacturers say that it is durable and will withstand all possible adverse conditions. The safeguard against showing a clear signal when danger exists is claimed to be perfect. Normally, the first of the two signals encountered at the entrance of a block stands at clear, and the second one at danger; the latter cannot be changed to clear unless the first one performs its functions properly.

The apparatus on the South Side elevated has been in use for a year and a half with 204 trains passing each signal every day. There are 37 automatic signals altogether, and the cost of their maintenance for the year ending June 30 was $3.65 per signal per month. This includes all labor, material, oil, lighting and inspection.

The Three Latest Fast Runs.

	N. Y. Central. New York to East Buffalo.	West Coast. London to Aberdeen.	L. S. & M. S. Chicago to Buffalo.
Date	Sept. 11, 1895	Aug. 22-23, 1895.	Oct. 24, 1895
Weight of cars	361,000 lbs.	150,000 lbs.	334,500 lbs.
Distance through, miles	436.32	539.75	510.1
First Stage.			
Length, miles	142.88	158.	87.4
Departed	5:40:30 a. m.	8:00 p. m.	3:29:27 a. m.
Arrived terminus	7:51:55 a. m.	10:27:30 p. m.	4:54:53 a. m.
Time	2 h. 14 min. 25 sec.	2 h. 27 m. 30 sec.	1 h. 25 min. 26 sec.
Speed, m. p. h	63 79	64.27	91.38
Engine	No. 870	No. 1389 compound	No. 597
— cylinders	19 x 24 in.	Two 14 x 30 in. / One 24 x 30 in.	17 x 24 in.
— drivers	78 in.	84 in.	Four 72 in.
Second Stage.			
Length, miles	147.84	141.25	133 4
Departed	7:56:15 a. m.	10:30 p. m.	4:57:04 a. m.
Arrived terminus	10:17:10 a. m.	12:35:30 a. m.	7:01:39 a. m.
Time	2 h. 20 min. 25 sec.	2 h. 5 min. 30 sec.	2 h. 4 min. 35 sec.
Speed, m. p. h	63.17	67.50	64.24
Engine	No. 899.	No. 904.	No. 599
— cylinders	19 x 24 in.	17 x 24 in.	17 x 24 in
— drivers	86 in.	78 in.	Four 72 in.
Third Stage.			
Length, miles	145.69	150.00	107.8
Departed	10:19:35 a. m.	12:38 a. m.	7:04:07 a. m.
Arrived terminus	12:32:26 p. m.	3:07:30 a. m.	8,50:13 a. m.
Time	2 h. 12 min. 51 sec.	2 h. 29 min. 30 sec.	1 h. 48 min. 6 sec.
Speed, m. p. h	65.75	60.20	60.96
Engine	No. 903.	No. 90	No. 160
— cylinders	19 x 24 in.	18 x 26 in.	17 x 24 in.
— drivers	86 in.	78 in.	Four 72 in.
Fourth Stage.			
Length, miles		90.50	95.5
Departed		3:09:30 a. m.	8:51:56 a. m.
Arrived terminus		4:32 a. m.	10:17:30 a. m.
Time		1 h. 22 min. 30 sec.	1 h. 25 min. 32 sec.
Speed, m. p. h		66.	63.99
Engine			No. 598
—cylinders			17 x 24 in.
—drivers			Four 72 in.
Fifth Stage.			
Length, miles			86.
Departed			10:19:44 a. m.
Arrived terminus			11:30 34 a. m.
Time			1 h. 10 min. 46 sec.
Speed, m. p. h			72 91
Engine			No. 564.
—cylinders			17 x 24 in.
—drivers			Six 66 in.
Through.			
Distance, miles	436.32	539.75	510.1
Time elapsed	6 h. 51 min. 56 sec.	8 h. 32 min.	8 h. 1 min. 7 sec.
*Average speed	63.51	63.24	63.61
Time in motion	6 h. 47 min. 41 sec.	8 h. 25 min.	*7 h. 50 min. 20 sec.
Average speed	64.22	63.93	65.07

* Two minutes and five seconds deducted in the third stage, actual stop by flag.

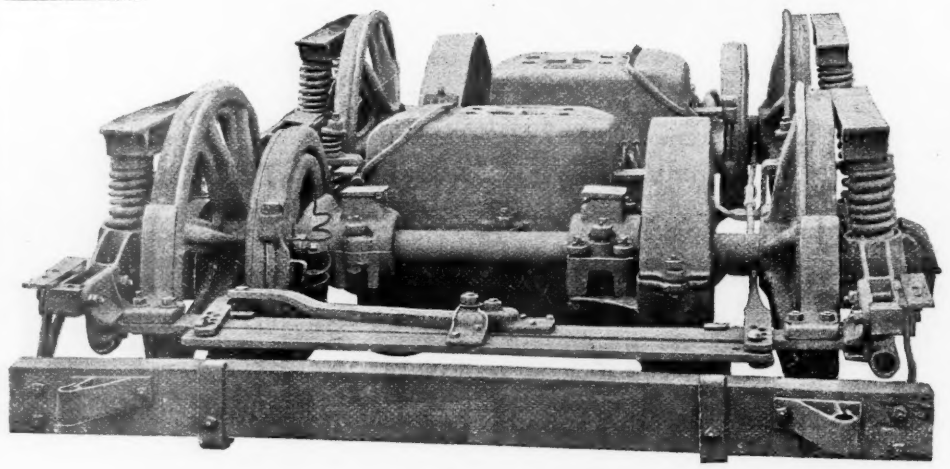
An Electric Brake for Street Railroads.

The General Electric Co. has brought out an electric brake for street cars which was shown in service at the Montreal convention. It is a development of the Sperry brake. The principle is to get the braking effect from the motor itself by turning it into a special dynamo run from the axle; that is, the energy stored in the moving car is utilized in developing the braking force. Thus the brake does not depend on the current through the trolley. In this arrangement the controller not only controls the motors, but at the same time operates the brake, starting, accelerating, retarding and braking the car. When making a stop, the controller handle is thrown from running to braking position. The operations are, cutting all connection with the trolley current the conversion of the motors into special dynamos for generating current at very low speeds and the application of the brakes. The rheostats and contacts used to control the motors in running the car, also control the current generated by the motors and needed to apply the brake.

The braking action is two-fold. The rotating armature of the motor, instead of tugging ahead, is pulling back and more or less powerfully braking the car through the gears, by the retarding effort of its magnetic field while generating the braking current. The power, therefore, required to perform this work, is taken from the energy of the moving car. Not only is the car thus retarded, but the brakes arrest the motion of the wheels directly with a force under perfect control of the motorman.

No new and strange device is introduced to the motorman; the combined electric brake and series parallel controller is the K2 controller slightly enlarged and provided with the necessary contacts to perform the operation described above. The brake mechanism is readily attached to the motor and axles—it consists of a cast iron disc keyed to each axle and a compact electro-magnet facing each disc and attached to the motor frame. The maximum current in the brake circuit is regulated by a limit switch adjusted to limit the current automatically to an amount just under the slipping point of the wheels. Independently of this switch, the brake pressure can be graduated by the controller handle and a smooth motion secured on grades. The disc and shoe are lubricated by a graphite brush, carried in the shoe and pressing against the brake disc. This prevents excessive wear from friction and reduces the resistance between the shoe and disc, an important feature, as the eddy currents set up in the brake and shoe and are even more effective in stopping the car than the simple friction between the shoe and disc.

The advantage of this brake if it proves to be a practical arrangement will be great. It can be applied to any axle without removing the wheels, the wear of the brakeshoe does not come on the tread of the wheel, and the wheels cannot skid.



G. E. Electric Brake and Controller for Street Cars.

Cross Ties and Poles for Street Railroads.*

The author gives some experiences with various kinds of ties in street railroad work and says that six years is the longest life to be expected of selected pine ties and eight years is the maximum life of oak ties. It was expected that street railroad ties, being under paved streets, would be preserved by the exclusion of air, as this theory was in accordance with experiences reported by many street railroad engineers; but the author cannot see why street railroad ties should ordinarily last longer than buried steam railroad ties. He has gone quite thoroughly into the question of using ties of greater first cost and longer life. There is no uniformity of opinion or practice among street railroad engineers, as to the best tie to use. It seems to be generally conceded that metal ties are unsatisfactory.

In New Orleans horse car tracks red cypress ties are reported to have been found in good condition after 28 years of service. Red and black cypress are very durable woods, but they are very soft. The extraordinary results reported in New Orleans are doubtless due to the light wear under horse cars and to the fact that these ties were always in very damp, marshy earth, if not actually submerged in water.

We find among engineers in the South and West a great diversity of opinion as to the merits and life of cypress timber, both for trestles and for ties. Considerable confusion seems to exist as to the proper classification of the different kinds of this timber, white cypress being worthless, and red (which is perhaps most extensively used) being a little inferior to black cypress. It is claimed that even expert inspectors can seldom distinguish one variety from another, and that cypress dealers often classify the product of one tree as belonging to the three varieties. The life of black cypress in trestles is reported to vary from eight to 20 years, averaging perhaps 12 or 14 years, while its life in railroad ties is between seven and 12 years.

After consulting all the few reports and treatises available upon the subject of timber preservation and many members of the American Society of Civil Engineers, we conclude that creosoted ties are the most economical for use in street railroad work. At present we omit the vulcanizing process, which has in a few cases given good results. The preservation of timber in quantity is confined almost exclusively to two long-established processes, burnettizing and creosoting. Burnettizing, or treatment with zinc chloride, is the process (modified by patents in some cases) most extensively used in America for the preservation of railroad ties, mainly on account of the less cost, its fire-proofing qualities and on account also of its being simpler or safer than treatment by injections of other metallic salts.

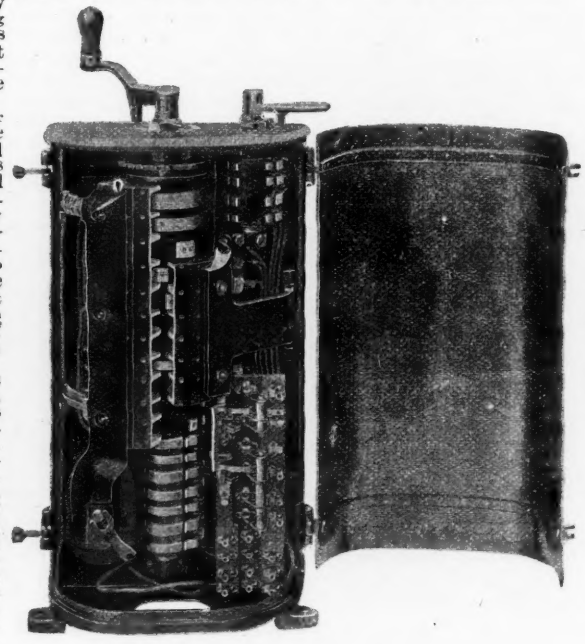
Burnettizing is extensively used in the west, and it has given good results, especially in dry localities, but there are many conditions met with in street railroad construction which are unfavorable to its success. Zinc chloride is a salt, easily washed out when exposed in wet localities; second, leakage electric currents from the rails might hasten its disappearance; third, it has a tendency to rust the rails and spikes.

The creosoting process was invented and established in 1838 by John Bothell of England, and for many years past has been almost universally used in England and France for ties and telegraph poles.

The average life of creosoted beech ties on the Northern Railway of France is twenty-seven years. Properly creosoted spruce ties in England last from 16 to 20 years. It is reported that the mile of track laid of different kinds of creosoted ties on the Mississippi, New Orleans & Texas, near West Pascagoula, Miss., in 1869, showed when examined in 1886 that seven of these ties had been removed, one because decayed, and six from being cut into by the rail. Trestles built on the Houston & Texas Central 22 years ago were recently reported in good condition. Many cases have been reported in this country where creosoted timber was sound after 16 years of service.

Creosoted timber is in many respects peculiarly suited for street railway ties. Creosote cannot be washed out, and being a perfect con-conductor, is beyond the reach of the electrolytic action of leakage currents. Such timbers might have an important bearing (especially in stringer tracks) on reducing the leakage from the rails to the water-mains. Its tendency is to prevent iron and steel from rusting.

For a long time 6 in. × 8 in. × 7 ft. were our standard dimensions for ties, but a year ago we changed these to 5 in. × 9 in. × 7 ft. In railroad practice where heavy loads are carried upon low rails it has been found that too broad a tie would rock itself out of a proper foundation in ballasted track, and it is on this account that



broad ties are objectionable in ballasted railroad work, 6 in. × 8 in. × 8 ft. being the adopted standard. In street railroad work, however, where deep rails are used and where this "rocking" amounts to nothing, we think a broad tie has many advantages over the narrow ones sometimes used.

We have recently put in 3,000 sap pine ties from the Fernandina Oil & Creosote Works, and are expecting good results from them. These ties, treated with 12 lbs. of dead oil of coal tar (creosote) per cubic foot, can be delivered in Atlanta for 60 cents each. First-class pine ties now cost us 26¼ cents each, oak 30 cents, and black cypress 40.

With the present scale of wages tearing up and renewing track paved with ordinary Belgian blocks, with sand foundation and filling, will cost about 36 cents per lineal foot of single track, and hence we can readily make a comparison for determining the most economical tie to use.

We can safely assume 24 years as the life of a creosoted tie. With this assumption let us determine the cost of keeping the different kinds of ties under sections of track for 24 years.

Assuming the ties to be spaced 2 ft. 6 in. apart center to center, creosoted ties will cost 24 cents per lineal foot of track, therefore 60 cents (36 + 24) will represent the cost of labor and ties in rebuilding. Principal and interest on 60 cents, at 6 per cent. for 24 years, equal $1.46, which is the actual cost per lineal foot of keeping ties under this track for 24 years.

Cypress ties will cost 16 cents. and 52 cents (36 + 16) will represent the cost of labor and ties per lineal foot in rebuilding where they are used. With a life of 12 years two renewals would be required in 24 years: therefore for the first renewal,

Principal and interest. 52 cents, at 6% for 24 years..... $1.27

And for the second renewal,

Principal and interest, 52 cents, at 6% for 12 years..... .89

Total..... $2.16

Oak ties will cost 12 cents a lineal foot and 48 cents (36 + 12) will represent the cost of labor and ties in r -

* Paper by N. W. L. Brown, C. E., Jun. Am. Soc. C. E., Assistant Superintendent of the Atlanta (Ga.) Consolidated Street Railway Co.; presented at the annual convention of the American Street Railway Association, Montreal, condensed.

building, where they are used. With a life of eight years three renewals would be required in 24 years, therefore for the first renewal,

Principal and interest, 48 cents, at 6% for 24 years..... $1.17

For the second renewal,

Principal and interest, 48 cents, at 6% for 16 years ..... .91

For the third renewal,

Principal and interest, 48 cents, at 6% for 8 years..... .71

Total..... $2.82

Pine ties will cost 10½ cents per lineal foot and 46½ cents (36 + 10½) will represent the cost of labor and ties in re-building, where these are used. With a life of six years four renewals would be required in 24 years, therefore for the first renewal,

Principal and interest, 40½ cents, at 6% for 24 years $0.988

For the second renewal,

Principal and interest, 40½ cents, at 6% for 18 years..... 0.812

For the third renewal,

Principal and interest, 40½ cents, at 6% for 12 years 0 69

For the fourth renewal,

Principal and interest, 40½ cents, at 6% for 6 years..... 0.751

Total..... $3.077

From these comparisons we see that with the lives assumed, cypress will cost 48 per cent., oak 92 per cent., and pine 111 per cent. more than creosoted timber. These comparisons assume that the service of the different ties during their lives is equally satisfactory, which is practically correct in the case of oak, pine and creosoted pine: but cypress, on account of its softness, gives inferior service.

These figures take no account of the disturbance to travel and to residents along the street while renewals are going on, or of the fact that repairs are necessary long before complete renewal, and that these repairs would be much less where the track was going to pieces once than where the process was repeated several times in a given period.

We have assumed in this comparison contract prices on creosoted ties delivered by rail from a point many hundred miles distant: street railroad companies can generally creosote their own timber at much less cost than they can expect to have it done by contract.

These creosoting establishments are generally extensive affairs, and while they may be kept busy for months at a time we think it is a fact that their interest on investment, salaries for expert superintendence, sa es department, labor, etc., are much more regular items than their orders.

It would be economy for any street railroad company operating extensive lines, and affected like ourselves with short lived ties, to install a small creosoting plant on the power house premises, which are generally large, and supply this plant with steam from the main boiler plant and with power for its pumps, etc., by means of eleectric motors. In this way expert superintendence could be given by the chief engineer, the plant could be operated economically, and when lying idle the interest on the cost would be about the only expense connected with it.

A porous wood is necessary for proper treatment, and while beech, on account of its great toughness, seems to give better results than almost anything, spruce and sap pine are standard articles for treatment. In many localities, especially in the South, this sap pine timber, which is in little demand ordinarily, can be had at a very low price, and with a plant installed and operated in the manner outlined above we feel sure that these ties could be purchased and treated at a total cost not exceeding 40 cents each.

We estimate that a plant, consisting of a treating cylinder 6 ft. in diameter and 36 ft. long, with a capacity of about 300 ties a day, should not cost more than $6,000 complete with necessary cars, pumps, tanks, superheating apparatus, etc., necessary for operating it. Not only would such a plant be of service for ties, but also for treating floor timbers for cars, timbers for trestles and bridges, perhaps, and especially for treating cross arms and poles for line construction.

POLES.

Red cedar poles have been almost universally used in our overhead construction, although iron poles set in concrete have been used in the heart of the city, and cypress poles in a few cases, when we could not secure cedar promptly.

The specifications by which most of our cedar poles were purchased required 28 ft. in length and a minimum top diameter of 6 in.; but these poles proved too small, and in many cases too short, especially where guard wires are required. Our red cedar poles are generally obtained in East Tennessee, although the timber is found more or less plentifully in many sections of the South. It has been used almost exclusively by the Western Union, and they estimate that their poles last on an average about 15 years. The sap generally decays in five or six years, and in many cases they find that the heart decays in 12 years, while again in many cases it will last 20 years.

Cedar poles, especially when used according to the ordinary custom, have many defects in street railroad service. Their life is practically limited to the life of their sap, as when this decays the heart left is too small and weak for reliable service. Larger poles are liable to be very defective, generally being hollow at the butt, and frequently containing rotten knots. Cedar is very brittle and treacherous under tension. Large, short poles are excessively expensive, as they are equivalent on the market to long poles cut off.

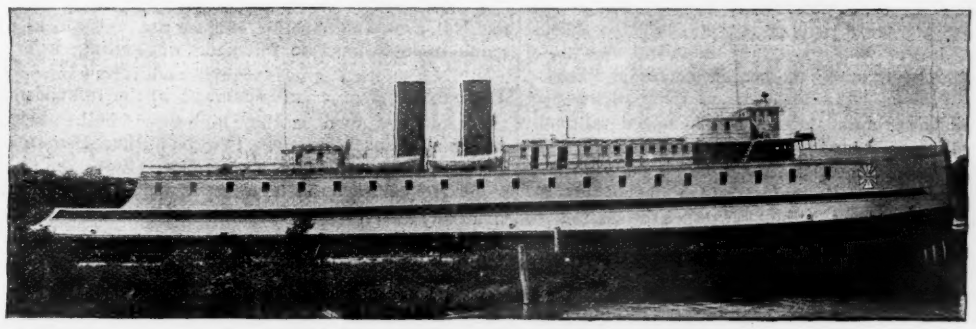
We are now estimating that our cedar poles with large hearts will last 12 years. The cedar poles we have used appear to have cost us about $4 each, erected.

Our iron poles, which have cost about $18 each, erected, do not appear to be lasting as well as was hoped. They have too great a tendency to rust near the ground, and we doubt whether they can be safely depended upon for more than 15 years. We belive properly creosoted pine poles, 30 ft. long and 8 in. at the top ordinarily, and 10 in. to 12 in. at the top where special demands are made upon them, will give as good service as any poles on the market and be more durable. These poles, treated by contract to 10 lbs. of creosote per cubic foot should not cost more than $5 each, erected, and when treated in ones own plant, this price could doubtless be reduced to $3.50.

Pine in its growth is one of the most perfect and symmetrical of all timbers, besides having a tensile strength about twice as great as cedar. Creosoting is generally conceded to increase the strength, and all these properties would seem to indicate that the creosoted pine pole should be strong enough and neat enough for city work.

Mr. W. H. Preece, the celebrated English telegraph engineer, reported in 1884, as a result of 30 years' experience, that he had never seen a properly treated telegraph pole which showed the least decay, and he referred to 318 poles, which after 35 years of service were torn down to make way for larger poles, every one of which showed after this service no signs of decay. Creosoted poles are universally used in English telegraph works. The District Superintendent of the Western Union Telegraph Co. here tells us that he was recently asked to examine a lot of creosoted poles, supplied to his company for experiment by the works at West Pascagoula, Miss., 12 or 15 years ago, and that he found every one in perfect condition. He dug down to the bottom of many and could find no sign of decay. Creosoted poles installed near St. Augustine, Fla., in 1888, have within the past few days been carefully examined and are reported by the Superintendent of the Western Union as showing no trace of decay. Creosoted poles have a great advantage over iron poles in being perfect insulators. Iron poles are grounded conductors, and liable to cause accidents to the lines and linemen.

If creosoted poles are superior to cedar in almost every respect, the question naturally arises, why are they not adopted by the Western Union? This question is easily answered. Most of the poles of this company are along the railroads and exposed to danger of fire. A creosoted pole is very inflammable and they are afraid this one great disadvantage in their work would more than offset its advantages.



Car Transport of the United States & Ontario Steam Navigation Co.

See Article on Car Ferries.

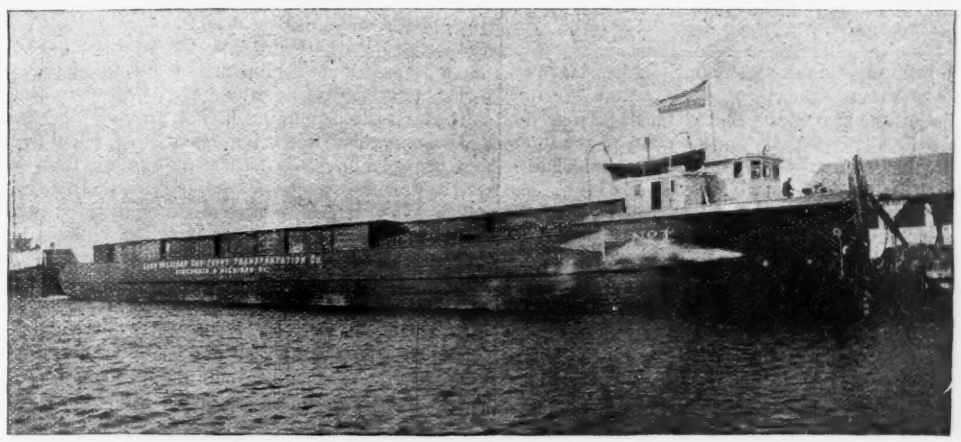
A Composite Wheel for Electric Motor Cars.

A simple, ingenious and promising method of making a composite car wheel has recently been brought forward by Mr. W. J. Taylor, of the Taylor Iron & Steel Co., of High Bridge, N. J., and is illustrated in the engraving herewith, from a photograph of a section of the wheel. The wheel is cast-iron, with a steel band imbedded in the tread. This steel ring is put in the mold before the wheel is poured, and is welded into the mass of the cast-iron wheel, making it an integral part of the wheel. At the same time the flange and throat are chilled by the ordinary method. The result is a chilled flange (which, perhaps, is the best possible metal for resisting flange wear), and a softer and tougher metal, namely the steel tread, to resist the abrasive effects of traction and of breaking.

The theory on which the wheel has been developed is that the chilled tread disintegrates rapidly under the action of the brake shoes, causing frequent and considerable changes in temperature, as well as under the effects of pulling on the rails, and it is held that steel has superior qualities for resisting this sort of action. The wheel which we illustrate has been devised to get the special advantages of both metals, chilled cast-iron and steel.

The steel ring is somewhat larger than the true diameter of the wheel, to permit it to be turned accurately after the wheel is cast The perfection of the union between the two metals is indicated by the engraving. The wheel is not intended to be re-tired or turned after wear, but it can be made nearly as cheap as a plain cast-iron wheel of the same weight. Twelve of these wheels are now in service and have shown good results. In fact—very recent—information indicates that they are likely to do all that is expected of them, and Mr. Taylor will have them tried in steam railroad work, believing that the form is applicable to such service.

The Taylor Composite Wheel for Motor Cars.



Car Transport of the Lake Michigan Car Ferry Transportation Co.

See Article on Car Ferries.

The Whiteley Malleable Castings Company.

This company, whose shops are at Muncie, Ind., in the center of the natural gas belt, is now very busy, and is enlarging its works. These shops make the American, the National and the Williams car couplers, and 10,000 of the last named are now being made for the Chicago, Burlington & Quincy. The company, which has heretofore made a good many castings for carriages and agricultural implements, has dropped some of its lighter business, and is now devoting its chief attention to railroad work. The shops have an annual capacity of 15,000 tons of malleable iron and 8,000 tons of gray iron White metal and brass castings are also made. About 250 molders are now at work, with 50 core makers and 200 employees in other departments. Natural gas is the only fuel used in these shops, gas being used for melting and annealing. The company uses about 800,000 cu. ft. of gas daily, from wells which have a capacity of 2½ times that amount, and which seem to be flowing at the same rate as that of 6 years ago.

The shops of this company occupy a tract of 12 acres and the floor space in the buildings amounts to 469 acres. The works were started about a year ago. The molding department is 571 ft. long and the annealing department 350 ft. Each molder's bench is supplied with running water and a Reynolds molding machine; and all the appliances in the works are of the very latest and most convenient style. The building for storing patterns is fire proof, and contains 7,550 sq. ft. of floor space. The roof, doors and window shutters are of metal.

The new buildings now being erected are to give additional room to the core department and annealing room. When these additions are finished 400 car couplers can be made each day.

RAILROAD GAZETTE

ESTABLISHED IN APRIL, 1856.
Published Every Friday
At 32 Park Place, New York.

EDITORIAL ANNOUNCEMENTS.

Contributions.—*Subscribers and others will materially assist us in making our news accurate and complete if they will send us early information of events which take place under their observation, such as changes in railroad officers, organizations and changes of companies in their management, particulars as to the business of the letting, progress and completion of contracts for new works or important improvements of old ones, experiments in the construction of roads and machinery and railroads, and suggestions as to its improvement. Discussions of subjects pertaining to* ALL DEPARTMENTS *of railroad business by men practically acquainted with them are especially desired. Officers will oblige us by forwarding early copies of notices of meetings, elections, appointments, and especially annual reports, some notice of all of which will be published.*

Advertisements.—*We wish it distinctly understood that we will entertain no proposition to publish anything in this journal for pay,* EXCEPT IN THE ADVERTISING COLUMNS. *We give in our editorial columns* OUR OWN *opinions, and those only, and in our news columns present only such matter as we consider interesting, and important to our readers. Those who wish to recommend their inventions, machinery, supplies, financial schemes, etc., to our readers, can do so fully in our advertising columns, but it is useless to ask us to recommend them editorially, either for money or in consideration of advertising patronage.*

Another 500-mile fast run has been made, and we give quite full accounts of the performance, with descriptions of the locomotives, on other pages of this issue. As in the runs of Aug. 22 and Sept. 11, close comparisons between the latest aspirant and its chief rivals for the highest honor are somewhat difficult to make, without a careful study of many details. The Lake Shore engines are less powerful than those of the New York Central, but, on the other hand, the grades are more favorable. The New York Central has two entirely separate tracks for freight trains, but, again, the Lake Shore had all freight trains stopped so as to guard against any accident as the trains passed. The cars of the Lake Shore train weighed about 15⅜ per cent. less than those hauled by the New York Central on Sept. 11. The area of the pistons of the locomotives is about 20 per cent. less, and the Lake Shore eight-wheel engines have 22½ per cent. less weight on drivers than the New York Central's No. 999. There is also a difference of 27 per cent. in heating surface and 40 per cent. in grate area. No. 999 is designed to carry 190 lbs. steam pressure, and the Lake Shore engines 180. But as the Lake Shore people evidently feel confident of their ability to make even better time, whenever they may happen to feel like exercising their racers, perhaps it will not be worth while to make minute comparisons at present. The Lake Shore undoubtedly holds the record, for the present at least.

The Interstate Commerce Commission has taken official cognizance of the recent action of the Western lines in putting into effect reduced tariffs between terminal points, ignoring the fourth section of the Interstate Commerce law (the long and short haul clause). A circular letter has been addressed to 42 of the roads, citing two specific alleged violations, one the making of rates from Missouri River and Mississippi River points, St. Louis, Chicago, New York, Boston, Philadelphia, Baltimore and other Eastern points to Colorado common points on classes 5, A, B, C, D and E, and the other rates on coal and other commodities from Eastern points to Omaha, Kansas City and other Missouri River points. The various roads so charged are ordered to file their answers with the Commission before Nov. 5. This action of the Commission, according to a reported interview with the chairman of the Commission, was instituted because of complaints which were received from interior points after the Atchison and other lines issued the recent reduced tariffs to Colorado common points. As was noted in our traffic columns at the time, the Receivers of the Atchison inserted in their tariffs a clause stating that the rates so made were not considered reasonable, but were forced by the excessive competition of other lines. Receiver Walker is quoted as saying that the Atchison would plead in justification of its action the undue competition of the other lines which cut rates secretly, thereby creating a competition which could only be legally met by the issuance of reduced tariffs, and that to apply these reductions so forced to intermediate points would result in entirely destroying the revenues of the line which desired to act honestly. In other words, the Atchison will claim that dissimilar conditions were created by the secret cutting of its competitors which justify the Commission in making an exception in its favor. Just what defense the other lines will make has not transpired, but they will probably attempt to justify their action on the ground that the Atchison created dissimilar conditions which warranted them likewise in ignoring the fourth section. There are several fine points to be determined in this case, and its outcome will be looked for with interest, none the less so because of the position taken by an ex-member of the Commission, whose reputation for conservatism is well known.

The report of the Fitch committee on the relations of railroads to their employees, which was presented to the last meeting of the American Society of Railroad Superintendents and was published in the *Railroad Gazette* of October 18, has a quality of its own which marks it as much above the average of such productions; and every one interested in railroad discipline, who has not already done so, should read it. The sentiments expressed are as elevated and philanthropic as those of the "mere theorists" who are suspected if not despised by the "practical man"; and yet the members of the committee are hard headed men, of the most practical sort, and are all in active service on prominent and well-managed railroads. Everything they say bears the stamp of sincerity. Two points in this report should be specially emphasized. One is the statement (which was not fully set forth in our account of the report) that the committee received communications from men on prominent roads in all parts of the country, and that the sentiments of the report are a true reflection of the sentiment of these replies from members. This discounts the objections of those who may claim that the substance of the report is provincial or one-sided in its origin. We understand that only one superintendent answered the committee's questions in the tone, so familiar in former days, of the autocrat who bounces brakemen on the same plan that we bounce perverse hogs when unloading at the stock yards. The other point to which we call attention is of the opposite kind; the committee finds that "a tendency" to harsh and oppressive discipline still exists. In other words, the superintendents who aim constantly to be duly considerate in the treatment of their men, and who answered the committee's circular, have neighbors who do not pursue such an enlightened policy and who did not answer the circular. This is the condition to be expected: silence is the safest refuge of harsh discipline. Very likely most of the silent ones are not members of the society and so did not receive circulars. The sum of the report, therefore, is that enlightened discipline, tending powerfully to elevate the morale of the railroad service, is now common in all sections, but not so universal but that managers have still to be on the watch against short-sighted division superintendents.

It would be premature to say that a boom has begun in Birmingham, notwithstanding the interesting fact recently noted in our columns that the Tennessee Coal, Iron & Railroad Co. had sold 25,000 tons of basic pig iron to the Carnegie Steel Co. Let us hope, indeed, that a boom will not begin; but it is safe to say that a period of prosperity is setting in. About two-thirds of the blast furnaces in the district are now working, and others which are being repaired or rebuilt will soon be blown in. The market for pig iron is so active, and the prices are so good, that the prosperity of the furnaces seems to be assured, for the present at least. The question of using any of the product for making steel in the district where it is produced is not settled. There has been a good deal of talk about building an open-hearth plant, and one of the largest concerns in Birmingham has recently told us that it is a settled fact that a plant for making open-hearth basic steel will soon be built there. The present idea is that the output of this plant will be consumed in making plates, bridge material and structural shapes. Another story, important if true, is that the great interests of the Sloss Iron Co. and the Tennessee Coal, Iron & Railroad Co. are to be consolidated. The coal business in the district is extremely lively, the output being limited now only by lack of cars for shipping. The condition of the Ohio River has something to do with this, as the coal which would naturally go from the Pittsburgh district to supply lower Mississippi points is tied up by low water, and it is the hope of the Birmingham miners that the Ohio coal barges will not move before the river freezes up. A tipple has been built at Greenville on the Mississippi, and the Corona Company is sending coal that way for points down the river. Meanwhile an association of miners of Walker County has been formed with the hope of maintaining prices, a task comparatively easy with a rising market.

Brakes for Fast Trains.

The recently published reports of air-brake trials on the North Eastern Railway of England, call attention to one very notable difference in the practical working conditions on English and American railroads which is important in considering the safety and practicability of the higher speeds, toward which recent efforts have been directed.

It is eight years since the very superior efficiency of the quick-action air-brake compared with the older forms of power train-brakes was fully demonstrated. American railroads did not wait to be forced by public opinion into the adoption of an appliance which offered such an increased security, but at once began to remove the less efficient brakes of earlier times and to replace them by the best. This change of brakes was so rapidly and so generally effected that nearly all the passenger trains of the United States have, for several years, been under the control of the quick-action air-brake. When, at a more recent date, high speed trains became an established feature of every-day railroad service in this country, even the superior efficiency of the quick-action brake seemed to fall short of assuring such safety as the high speeds require, and it was in response to an actual existing demand by the railroads that what is known as the "high speed" brake was developed. For more than two years the "Empire State Express" trains of the New York Central have been equipped with the high-speed brake, and now it is in daily use on the "Congressional limited" trains of the Pennsylvania between New York and Washington. Without doubt other fast trains will soon be equipped with this improved form of brake, which stops a train in about 25 per cent. less distance than the ordinary quick-action brake, and possesses other advantages that contribute additional security.

It is difficult to realize that, although the average speed of passenger trains is greater in England than in this country, almost the entire passenger rolling stock of English roads is still equipped with the inferior types of brake apparatus that were years ago removed from the cars of even the poorest railroads of the United States, and that the English railroad officers seem to be only now giving some attention to the fact that there are brakes in the market which will stop their longer passenger trains in not much more than half the distance now required. It is still more difficult for an American to understand how it is that the English public has quietly submitted to this state of affairs so long. The Englishman is, beyond all other men, famous for his indomitable courage and persistance in securing and maintaining all the rights to which he believes himself entitled, and we should have expected long ago to see the British press blazing with resentment against the negligence and apathy of the railroad companies in reasonably providing for the safety of their high-speed trains. The strict Board of Trade requirements of English railroads in regard to signals are in strange contrast with the laxity respecting brakes; for, although an effective system of signals is of high importance, signals serve for protection against only certain classes of accidents, while the efficiency of the brakes must be depended upon in every emergency which threatens the immediate safety of a moving train and, in many such emergencies the safety of trains is wholly beyond protection by signals.

The supreme importance of being able to stop a train in the shortest possible distance has received prompt recognition in this country; but in England the inferior character of their brakes has apparently satisfied the public and most of the railroads, and in those cases where the railroads have recognized the importance of a better brake, it appears to be the custom to use "converted" brakes, resulting from the mere application of a quick-action triple valve to the old apparatus—a makeshift which only partially realizes the increased efficiency of the quick-action brake, and which we understand has in no case been adopted in the United States.

Car Ferries.

To the student of railroads few things are more interesting than the way in which methods have developed from physical and social conditions; and the physical and social conditions being so different in different countries results are seldom very closely comparable. Railroad practice in the United States has been immensely modified by the existence of great water courses to be crossed or paralleled or utilized, and it was the abundance of formidable rivers which from the start called for that boldness and originality in bridge work, which soon made American bridge engineers the leaders of the world in their specialty.

Another result of the existence of the great rivers

and bodies of inland water has been the development of the car ferry, almost unknown in any other country, but which here is an important part of the railroad system. In the notes which follow we have undertaken to put together an account of some of the more important car ferries, but we do not suppose that we have included all of the important ones, and indeed there are several which are not mentioned in these notes.

To begin in the waters surrounding New York. The New York, New Haven & Hartford has long worked an extensive system of transfer of both freight and passenger cars. The floating equipment of this railroad, working from the Harlem River terminus, consists of two transfer steamers, the Maryland and the Express, both of which we have described in times past. The Maryland has a capacity of 6 long passenger cars or 12 freight cars, and the Express a capacity of 10 passenger or 19 freight cars. Then in addition there are 10 large tugs and 35 floats, the latter having a capacity of from 10 to 17 cars each. The Maryland is used principally for transferring the Boston and Washington passenger trains from the dock on the Harlem River to the Pennsylvania station on the west side of the Hudson River. Two of these trains are transferred each way every day. This vessel is also used for transferring freight cars when not required for passenger service. The Express is used as a relief boat for the Maryland when required, and at other times for transferring freight.

The New York, New Haven & Hartford connects for freight business with the Long Island Railroad, 6 miles, the Pennsylvania, the Central Railroad of New Jersey, the Lehigh Valley, the Delaware, Lackawanna & Western and the Erie, an average distance of 12 miles. Furthermore, 20 of the smaller floats in service are used between the Harlem River and the local freight stations of the New York, New Haven & Hartford, piers 45 to 52 in the East River. Here the cars stand on the floats until loaded and unloaded, and therefore the floats make but one or two round trips a day. The other 15 floats, which have a capacity of 16 or 17 cars each, make about four round trips a day between the Harlem River landing and the connecting lines in Jersey City, and, as a rule, two of these floats are towed by one tug.

From Jan. 1 to Sept. 1 of this year—that is, in eight months—these floats transferred to and from the railroad connections mentioned above a total of 238,820 cars, and to and from the company's New York piers 74,442 cars, making a total of 313,262 cars handled in the eight months.

Of course the other railroads terminating on the waters of New York harbor, that is, the Pennsylvania, the Erie, the New York Central, the Central of New Jersey, the Long Island, etc., all operate constantly a large floating equipment, the business of which is transferring freight cars between their own termini and their own or other piers in the harbor. For instance, the floating equipment of the Pennsylvania Railroad Company includes 18 tug boats, 45 barges and 65 car floats. The floating equipment of the New York Central includes 20 propellers and steam tugs, 64 barges and 27 floats. The greater part of this equipment in both cases is employed in the waters of New York harbor. The Long Island Railroad has seven floats, two of 17 cars capacity each, with three tracks. These carry cars to and from the Pennsylvania terminal in Jersey City and to other piers in the harbor.

The capacity and flexibility of this method of handling freight, the cheapness with which it is done, the ease with which cars can be delivered to any point on the water front, the unlimited development of which the system is capable are all elements which conspire to make any bridge across the North River or any tunnel underneath that river a superfluity, so far as handling freight may go. This is a fact which is well understood by promoters in this country, but which should be carefully borne in mind by foreigners who are asked to invest in such projects; and all-rail connection with Manhattan Island must, it appears to us, depend for its revenue almost entirely upon passenger business, and for reasons which we need not go into here, upon a small percentage of that business.

The car ferries working in the waters of New York Harbor are, of course, subject to no stress of weather other than fog and running ice in winter, and yet the East River is so crowded with traffic that navigation there is about as close as anywhere on earth.

Quite a different set of conditions is found in the car ferry of the New York, Philadelphia & Norfolk Railroad running between Cape Charles and Norfolk, Va. This service was begun on the completion of the railroad in November, 1884, and has been in successful operation ever since. The distance is 36 miles. Here the floating equipment consists of two steamers which run in connection with the passenger trains, three tugs and four barges. The two passenger steamers do not carry cars. They are stout and seaworthy propellers which carry the train passengers and also carry on deck a good deal of loose freight. When the road was first opened a transfer steamer was put in service with the purpose of transfering through passenger cars between Cape Charles and Norfolk, and this service was successfully carried on for a year or two, transferring passenger coaches and sleeping cars regularly. At that time, however, the company had no through connection south of Norfolk and the service was abandoned and the transfer of passengers has since been made by the propellers which we have mentioned.

The tugs and barges transfer the freight cars across the bay. The largest of these barges is 311 ft. long and 37 ft. beam. It is built of iron, has four tracks and has a capacity of 24 large box cars. The average time made by a tug towing one barge across the bay in good weather is 4½ hours, and towing two barges, which is often done when the weather is favorable, from 5 to 5½ hours. The total number of freight cars transferred in both directions in the year 1894 was 36,772. At the Cape Charles terminus there are two double track transfer bridges transferring the cars between the barges and the railroad track. At Norfolk and Portsmouth are similar bridges which transfer cars from the barges directly to the Atlantic Coast line, Seaboard & Roanoke and the Norfolk & Southern railroads and other connections.

This route lies right across the mouth of the Chesapeake Bay exposed to the heavy Atlantic seas, and one would suppose that the business might often be interrupted. In fact, however, there are probably on an average not more than half a dozen days in the year when the barges are unable to cross.

Leaving the Atlantic Coast we find on Lake Erie a new car ferry service, which promises to be important. This is the enterprise recently started by the Pittsburgh, Shenango & Lake Erie Railroad, although we believe that the transfer line is under the control of a separate company, organized under the name of the United States & Ontario Steam Navigation Co. The purpose of this service is to make a direct car connection between the Pittsburgh, Shenango & Lake Erie at Conneaut Harbor, Lake Erie, and the Grand Trunk at Port Dover, Ont., a distance of 65 miles. One vessel has been in service here since about the first of September, and at the last information which we received it was expected that the second one would begin running about Oct. 10. These vessels are calculated to carry 26 30-ton cars or 30 smaller cars each. They are built by the Craig Ship Building Co., of Toledo, O., are about 300 ft. long, 52 ft. wide and 53 ft. deep from the top of the pilot house to the keel. They draw 12 ft. when fully loaded. Each boat has four tracks and the hulls are of white oak with steel outside of the planking. They have compound engines with a total of 2,000 H. P., have twin screws in the stern and a large club screw at the bow. The vessels are fitted up with electric and search lights, steam capstans and steam-steering apparatus. The trips are made in from five and a half to six hours, and it is said that they can be loaded and unloaded at either port in an hour. The builders guarantee a speed of 13 miles an hour in ordinary weather.

The vessels have limited passenger accommodations for regular passengers, but can accommodate on the decks from 1,000 to 1,500 excursionists in pleasant weather. So far no severe weather has been encountered, but it is not believed that there will be any difficulty in making the regular trips through the winter, except, perhaps, when ground ice prevents their getting into the docks.

Going westward we find the important car ferries at Detroit. The principal one is operated by the Michigan Central, although the Grand Trunk and the Canadian Pacific both transfer cars across the Detroit River at this point. The service is severe at times because of heavy running ice and the vessels used are staunch. The last one of which we have any description is the Transfer, of the Michigan Central. This vessel is 280 ft. long; 45 ft. 6 in., breadth of hull; 74 ft. 6 in. across the guards, and 17 ft. 3 in. deep. She is built of steel throughout. With 21 loaded cars she draws 11 ft. forward and 12 ft. aft. Her bow is strongly constructed, because of the ice service, and she has a steel deck and bulkheads. She has a paddle-wheel on either side worked by independent engines; also a screw.

At Sarnia and Port Huron, across the St. Clair River, the Grand Trunk has long had a car transfer which is now to a considerable degree replaced by the St. Clair tunnel.

One of the most interestingof the car ferry systems is that of the Grand Rapids & Indiana Railroad, across the strait of Mackinaw, seven miles. Here during most of the year there are no difficulties in operation, but in winter the ice is heavy; bnt there the boats are seldom delayed. The two transfer steamers employed here have a single screw at each end and are ordinarily run with both screws working. Their car capacity is 11 freight cars for one and 18 for the other.

An important car ferry service across Lake Michigan was begun nearly three years ago. This is the line run by the Toledo, Ann Arbor & North Michigan Railway between Frankfort, Mich., and Kewanee, Wis., a distance of 62 miles. The service was inaugurated in December, 1892, and the only interruption to winter service has come from ground ice in the eastern harbor. No interruption has taken place when 20 ft. of water could be secured in the harbor. Two boats are run, having a capacity of about 40,000 cars a year. They are entirely self-contained, and no floats are used. These vessels are 272 ft. long, 52 ft. beam, have four tracks and can carry 24 box cars. Their average capacity is 10 miles an hour, and the necessary time in port one hour. These vessels also run now to Menominee and Gladstone, 80 and 99 miles respectively.

The most ambitious scheme for the transfer of cars by water between railroad termini is the new one of the Lake Michigan Car Ferry Transportation Co., which we described Sept. 6, page 586. Three companies are concerned in this, the Wisconsin & Michigan Railway Co., which owns a line from Peshtigo, on Green Bay, to Faithorn Junction, on the Minneapolis, St. Paul & Sault Ste. Marie Railroad; the Lake Michigan Car Ferry Transportation Co. and the South Chicago Terminal Co. The Wisconsin & Michigan Railway Co. is, we understand, the controlling organization. The distance from South Chicago to Peshtigo Harbor is about 240 miles, and the service here is by specially built vessels carrying the trains of cars on their decks, but with no power for propelling. The only steam power that they have is for working the steam-towing apparatus. The vessels are towed by powerful towboats. Each of these vessels can carry 28 freight cars. They are 316 ft. long, 24 ft. wide and draw 7 ft. They have four tracks on the main deck, and the freeboard is high enough to protect the cars except in very high seas. One of these vessels was put in service about the end of August. A second one is now in service, and it is the purpose of the company to build a third during the winter. These vessels are towed by a steel hawser wound on a drum on the towed vessel, which drum is geared directly to a small engine, making an elastic connection; the strain of the hawser is always acting directly against the steam. This arrangement is very speedy and convenient for changing the distance between the towing vessel and the vessel towed, and makes the handling of the vessels in port very expeditious; that is, the towed vessel is pulled up to the stern of the propeller and taken right into her dock.

The voyage from port to port is made in from about 28 to 30 hours. The loads so far have been mostly lumber and railroad ties, although it is expected to invade the ore country and bring down ore to South Chicago. At South Chicago the loaded cars are delivered to the Chicago, Rock Island & Pacific, also to the Chicago & Western Indiana Belt Line, which gives direct connection with most of the railroads reaching Chicago. It is the expectation of the operating company that this method of handling freight cars will show such savings in loading and unloading, trimming cargo, maintenance of track and rolling stock, and otherwise, as will lead to a great development of the system. Regarding this we venture no opinion; but at any rate it is a bold experiment and one which goes some way to disprove the assertion of Prof. George Forbes that the Americans are a people without imagination.

The car ferries of the Southern Pacific system in California are important. As long ago as 1880 the ferryboat Solano was built to work the traffic across the straits of Carquinez on the route from Sacramento to San Francisco. This vessel is 424 ft. long over all, 116 ft. wide over the guards and has four tracks which are supported by longitudinal, Pratt trusses under the track deck. These tracks will accommodate 24 long passenger cars, or 48 freight cars, with locomotives attached. The vessel is provided with 11 water-tight transverse bulkheads. The aprons at Benicia and Port Costa are arranged so that freight and passenger trains can be run aboard without being uncoupled from the locomotives, and each apron has four tracks.

In these notes we have given brief accounts of the longest, the most difficult and the most peculiar of the car ferries of the United States, but do not profess to have mentioned them all.

A Politician on the Trunk Line Agreement.

Senator William E. Chandler, of New Hampshire, who some weeks ago complained that the Trunk Line railroads were forming a trust to oppress the people, has "broke out" again. He has written to President Cleveland and to the Interstate Commerce Commission urging immediate action to prevent the execution of the new Trunk Line agreement. The agreement, he says, is plainly contrary to law. He vigorously attacks Interstate Commerce Commissioner Knapp for a statement that the matter was not one of which the

Commission could take cognizance, and says he should be removed. His letter to the President closes by saying that a word from him to J. Pierpont Morgan would cause the whole conspiracy to stop. (In which Bill "gives away" the real object of his talk, viz., to "put the Democrats in a hole," for he knows perfectly well how useless any protest from the President would be.)

In his letter to the Interstate Commerce Commission Senator Chandler says: "Nine great railroads from the West to the seaboard, with $3,000,000,000 capitalization, are to be permitted to consolidate their business; to abolish competition by their own agreement; to submit the rate-making power to nine Governors; to enforce their huge pooling contract by a clearing house and money penalties, and to establish, in defiance of law, the most stupendous trust the world has ever seen." . . .

Commissioner Knapp has written an open letter replying to Mr. Chandler. He says his published statements must not be attributed to the Commission and reiterates his assertion that the detection and punishment of crimes created by the interstate commerce statute is only an incident to the scheme and aim of "regulation," a feature with which the Commission has no power to deal. He adds that the courts seem to have reached a conclusion different from the view taken by Senator Chandler, that the alleged agreement is illegal and criminal under the anti-pooling and anti-trust laws. He says:

"It is evident that no combination of carriers, whether formed in evasion of existing laws or organized under legalized pooling, can be more powerful or alarming than their actual consolidation. In the New England States the process of absorption in one way or another has gone on until there is now practically no competition in the railroad service of that section. So far as I am aware this consolidation has not resulted in any increase of charges, but, on the contrary, has been attended by considerable reductions in rates, by improved facilities and the better accommodation of the public. Fewer complaints come to us from that region than from any other part of the country. I believe that the people in that territory would not welcome a return to competi tive conditions. I am yet to be convinced that similar results might not fairly be expected if co-operative action should be substituted for compulsory warfare on a broader scale and in more extensive fields. In short, I believe that the principle of association should be applied to public transportation; that the power to 'regulate commerce' should be exerted to secure firm and unquestioned control of the rates and charges which carriers may exact."

Senator Chandler's criticisms of railroad affairs have so many times been shown to be based on fallacies that everyone who has kept posted regarding the doings of the Trunk Lines will at once see the weakness of his position in the present case; but the regulation of railroad competition is a difficult problem at best, and is misunderstood by so many intelligent people, that the Senator's errors in the present letter are more than usually dangerous, and may be accepted by some as statements of fact. Some people will assume that he is simply over-zealous in a good cause, excuse his effusive language and swallow his false assumptions. Just a word to that class.

There is no pooling clause in the proposed agreement. As Commissioner Morrison says, if the railroads intend to pool their earnings, they are keeping the matter secret. Anyone conversant with railroad affairs must know how difficult—and, in fact, impossible—it would be to make pool payments without having them appear in the records, and Commissioner Morrison's statement can hardly be taken soberly. Railroad officers have many times made secret payments to shippers, no doubt, concealing the items on the company's ledgers under some false name. But when it comes to dealing with a sharp competitor on these shaky lines the problem is at once vastly more complicated. It won't work.

There is no proposition for a clearing house. Whatever may have been said about this subject at the outset, nothing practical came of it. It is almost equally true to say that the "absolute power of the nine governors" has petered out. The modifying clauses mentioned in our report of the agreement, with others, which come up for consideration this week, are, we regret to say, likely to greatly weaken the power of the nine governors.

The agreement does tend to abolish competition. No one denies this, and Mr. Chandler is welcome to all the satisfaction he can get out of the fact. But everyone knows that this is *only* a tendency. To effectively abolish competition, even enough to produce even a small advance in grain or flour rates, is practically impossible. The practical impossibility of effecting any serious check on the powerful competition now existing among the railroads between the West and the Atlantic Seaboard, so clearly set forth by Mr. Blanchard before the Congressional Committee, and elsewhere, is now generally recognized among conservative merchants and shippers as well as by railroad men; and this recognition is what has brought the best class of merchants around to the position where they will consent to the repeal of the anti-pooling law. We may safely permit the railroads to "abolish competition" all they can. Practically they will abolish it about as much as stoves abolish cold weather. It may be regarded as absolutely certain that any important stiffening of rates would very quickly develop some instrumentality to tear a hole in the fabric by which the railroads maintain their agreement.

Mr. Knapp's remarks, so far as published, touch only one phase of the question, but what he says should remind Senator Chandler that the real difficulty is the inadequacy of our present statutory regulations to meet the great business problems of modern transportation. When we freely permit consolidation, yet at the same time forbid the most moderate efforts looking to the amelioration of wasteful practices, without incurring the dangers of consolidation, we find ourselves in a position which is obviously absurd; but who will show us the way out?

The Railroads and the Bike.

Next to electric motive power for steam railroads, the most attractive subject for discussion, to the end-of-the-century daily newspaper editor, is the bicycle, and consequently the efforts, wise and otherwise, of the railroad companies to properly regulate the transportation of bicycles in baggage cars have come in for a good many editorial notes. First in Chicago, then in New York and then somewhere else, the bicycle riders find themselves abused, and the newspapers rally to their defense.

At Chicago, the last we heard, the wheelers wished to go *to* business on the cars and return by their own motive power, or vice versa; and the refusal of the railroads to carry two passengers—the steed and its rider—for the price of one, brought out a threat from the suburban passengers to smash the railroads' suburban business entirely—they would ride the wheel both ways. This threat, we suppose, is now in process of being carried out.

In New York just now the grievance is the action of the Pennsylvania Railroad in tightening up its extra baggage rules so that, for instance, from New York to Newark, a bicycle is charged 15 cents, which the papers tell us is 2½ cents more than a passenger has to pay (when he buys a round trip ticket). The company, they say, has taken a step backward. This, from a newspaper that loves high prices in ordinary mercantile affairs, suggests the query whether a merchant takes a step backward when he finds business so active that he can increase the price of coats or shoes—but let that pass.

It is possible that the roads which charge for bicycles do act contrary to their own interests. It may be that by taking a man and his wheel at the same price that is asked of another man for himself alone, enough additional business may be built up to increase rather than decrease the aggregate profit of the passenger business; but let it be clearly understood what the bicyclist is asking for. He is asking to have his unwieldly wheel, occupying two or three times as much space as a trunk (and monopolizing six times as much, on account of the impracticability of piling up bicycles as we do trunks) on the same terms as trunks. He should at once see the unreasonableness of this; but this is not all.

The railroad cannot be fairly asked to take even a trunk for every passenger. For ourselves we do not admit the justice of carrying trunks free; it is robbing the baggageless passenger for the benefit of others. As the robbery is not large, however, and the custom is of such long standing, that argument may be dropped. But the main reason why the free-trunk rule has remained undistubed so long is that most passengers do not wish to take along their trunk; could not be hired to. The volume of baggage, therefore, remains so small that one car always suffices for any ordinary train, and as long as this limit is not exceeded, 100 trunks can be carried as cheaply as 10, or practically so. The bicycle at once alters this favorable condition. A very small increase in bicycles necessitates the addition of another baggage car. There can be no question that if the railroads aim to make their rates equitable, as between passengers with wheels and those without, a small charge for the wheel ought to be invariably made; and in the case of suburban passengers it is to be remembered that the very small average quantity of baggage per passenger is one of the factors that permits such low rates for season tickets.

The address of President Ingalls, of the Chesapeake & Ohio, delivered at the Clifton Forge Young Men's Christian Association Conference in September is reported at considerable length in the *Headlight* (Detroit) for October. Mr. Ingalls stated that the Chesapeake & Ohio was in very bad shape when he assumed the management of it in 1888. The road and rolling stock were in poor condition and the personnel seems to have been about the same. Employees were not scared by threats of discharge, for they said they couldn't go to a worse road even if they went to Texas. In casting around for the best means of elevating the service it was thought best to encourage the Young Men's Christian Association, though the confidence of the management in it was not over strong. The results, however, have been exceedingly gratifying, and Mr. Ingalls gives the Association credit for a large share of the success of the road in weathering the severe financial conditions of the past two years. Freight has been carried for four mills per ton per mile, and yet they have kept out of bankruptcy. The Young Men's Christian Association was begun at Covington in October, 1890. The building at Hinton was built in November, 1891, that at Handley September, 1892; Gladstone, Va., July, 1893; Clifton Forge, October, 1893; and plans have been made for a building at Russell, Ky. The total expenditure on buildings has been $50,000, which sum, as near as we can make out, does not include the sums contributed by employees and others. The associations on the Chesapeake & Ohio now have about 1,000 members, equal to one-half of all the employees engaged in the transportation department. The daily average attendance at rooms last year was 566. Mr. George Bliss, of New York, and Mrs. J. Hood Wright have given liberal donations for libraries, and it is hoped to have circulating libraries for the small stations. In speaking of the results on the road Mr. Ingalls says that the service of the Chesapeake & Ohio is now such that he is ready to compare it with any line in the country. In carrying the mails he has beaten the larger roads. The freight men between Newport News and Cincinnati can be about as sure of their hours as the passenger men. The accident expense account has been reduced from $1,000 a day to less than $100. He hopes to establish hospitals, and, sometime, to see a system of pensions and annuities, also a savings bank. Profit-sharing has been considered so definitely by the directors that they have "determined that with the improvement in business they will establish a plan," though of course as yet there is nothing to divide, either for stockholders or employees.

It is reported that a considerable coolness which has for some time existed in the relations of the New York Central and the Boston & Albany with the New York, New Haven & Hartford has recently been settled and that the two first named will now have more favorable traffic arrangements with the New Haven. Since the latter road made an arrangement for close connections with the Pennsylvania and other Western roads terminating in Jersey City it is said that an overwhelming proportion of the through freight (to and from the west) of towns on the line of the New Haven road has gone by way of New York, and it appears that this is due to the fact that the New Haven Company made traffic agreements with the lines leading west from New York by which the proportions east of New York were much more favorable than those which could be secured by the New Haven on freight to and from the West by way of Albany. The transfer by water from the western terminus of the New Haven at Harlem River to the Jersey City stations is comparatively cheap and quick. Aside from ease of transfer and favorable division of rates, however, the mere fact that the New Haven Company gets a longer haul on most of its freight than it would if it exchanged the same with the Boston & Albany at South Framingham, Worcester, Springfield or Westfield is sufficient to explain why it would prefer to have freight go through New York. Even if it could get the entire haul east of State Line, which is 38 miles east of Albany, it would still prefer the New York City route, because it has ample facilities there, and because the New York Division has four tracks, whereas the Berkshire Division has only one; and it remains to be seen how much benefit the Boston & Albany and Vanderbilt lines will get out of the new arrangement. The dealings of the New Haven with the Boston & Albany, in freight as well as in passenger matters, seem to be gradually developing the fact that, howsoever much the New Haven officers might like to treat their neighbor philanthropically, taking pity on its "bottled up" condition, they are bound by the simplest business motives to make money for their own stockholders first. They are not bound to continue to give traffic to the B. & A. simply because it has been thus given in the past; but, in the absence of other strong reasons, only when by giving they can secure something in return.

The reporters say that the death knell of the canal mule was sounded last Saturday, which beautiful figure of speech means that on that day an experiment was made in hauling canal boats by electricity and with apparent promise of success. The experiment was made at Tonawanda, N. Y., and the system tried was that of Mr. Lamb, which involves towing canal boats by means of small motors running on a cable. The distance run was one mile and the speed was 3½ miles an hour, in one direction and 4½ in the other. A great many prominent men were present and ex-Governor Flower, of New York, made a long address. In the course of his talk Mr. Flower said that it costs $43.24 to haul a 240-ton boat from Buffalo to Albany by horse power and $17.60 by steam, while with electric power, at a rate of $20 per horse power, this can be done for $7.97. This is the contract price at which power is to be furnished. Moreover, the speed of boats can be doubled, as compared with towing by animal power, the result of which would be practically doubling the present capacity of the canal; and this system of towage involves no greater displacement than the horse boats require and consequently, ex-Governor Flower says, the necessity for deepening the canal "would be to a large extent done away with." Tuesday of this week a large and very enthusiastic meeting was held in New York City to boom the proposition now before the voters of that State, to spend $9,000,000 in improving the canals—a proposition which seems thoroughly reasonable and meritorious.

It is announced as we go to press that the directors of the Pennsylvania Railroad have approved the general form of the new Joint Traffic Association agreement; this action, with the approvals heretofore announced, is spoken of as making the success of the new Association certain, the companies yet to sign—the Chesapeake & Ohio, the Erie, the Grand Trunk and the Wabash—being regarded as sure to give their approval. But the amendments made since Oct. 10 are quite numerous, and some of considerable importance were not presented until just before the meeting of this week (which is in session as we go to press), and it would seem likely that considerable discussion may yet be necessary before the establishment of the association can be regarded as an assured fact.

NEW PUBLICATIONS.

The *Forum* is to publish in its November issue a contribution from President O. D. Ashley, of the Wabash Railroad, who has just published a volume of essays, under the title of The Railways and their Employees. The article will be a general review of the railroad situation in the United States.

The *Street Railway Journal* issued a souvenir edition (separate from its regular monthly issue) on the occasion of the Street Railroad Convention recently held at Montreal. This is a handsome book of 100 pages of reading matter, and the advertising pages are printed in three or four different colors. There is an inset, containing a direct process reproduction of a photograph of Montreal, which is 5 in. × 23 in. This is on heavy paper, but has to be folded twice. The principal contents of this special number are a series of special articles on the street railroads of the principal cities of Canada, all elaborately illustrated, and a history of the progress of the past 12 months in the entire field, made up largely of brief reports from prominent manufacturers of street railroad material and appliances.

TRADE CATALOGUES.

The Midland Railway, of England, is the subject of a 20-page illustrated article in *Commerce*, a London illustrated paper, for Aug. 21. The title of the article is The Peak of Derbyshire, which place is one of the prominent points of interest on the line of that road. The article has an excellent portrait of Mr. Turner, General Manager of the road, and dozens of large and handsome half tone reproductions of photographs of scenery.

The Lidgerwood Manufacturing Co. (New York), has issued a handsome pamphlet of 72 pages filled with direct process views of apparatus employed by contractors on the Chicago Drainage Canal, prominent among which will be found the traveling cable ways manufactured by this company. The description of the canal and the other letter press accompanying the pictures seems to have been very carefully prepared. The Lidgerwood Company's apparatus is described with great fullness, and records are given of work done by it on the canal.

Mountain Railroads in Switzerland.

Some notes concerning rack and other railroads for steep mountain grades, as seen in Switzerland, were published in the *Railroad Gazette* of Oct. 25, page 705, in connection with an account of a conference of engineers held at Zurich last September. The writer described the rack railroads of Rigi and Pilatus, which are well-known. The Stauserhorn Railroad, built more recently, was only briefly mentioned, but it is worthy of more extended notice. This road is a series of inclines operated by cables, which are driven by independent electric hoisting engines. The current is generated by turbines and dynamos, five miles distant on a mountain torrent, and it operates also a trolley line in the plain, supplies light for the village and a hotel and searchlights on the mountain tops. The road is constructed in three parts, each at an angle to the other, with varying grades up to 60 deg.; passengers dismount twice in the trip of about 5,500 ft.

Two cars are attached to the ends of a pair of wire cables, and are provided with automatic safety devices consisting of rail grippers, on one rail. These are thrown into operation by a worm operated by a pair of bevel gears, the driver of which is loose on the axle, becoming attached thereto by a conical friction disc or pulley which is pressed against its counterpart as soon as the tension on the hoisting rope is released. Should the rope break, or strain be released, the friction disc grips, and being revolved drives the worm which spreads the longer ends of two levers, the short ends of which are wide and flat and immediately bear against the web of the rail; less than two revolutions of the axles hold the cars in place without chance of slip. Bi-weekly tests are made of this device, which also prevents the wheel from rising from the rail as the jaws of grippers are directly under the heads of the rails. The conductor is supplied with an "electric whip," by which he can immediately communicate with the engineer at the terminals and intermediate stations. This "electric whip" is a brass rod provided with a wooden handle; two insulated wires passing through it connect at all times with the telephone and signals. Thus the car can be stopped instantly by the engineer on signal in case of need, even when out of sight. Of all the roads, this last is no doubt the smoothest and steadiest, at the same time being most economical. All of these mountain roads are built on solid masonry from end to end, and in no case is there any possibility of shifting of road bed. The hillsides are "palisaded," where the earth is not solid or where forests have been felled, and there are masonry gutters on either side. Numerous cowpaths lead over and under these roads, by stone arches, and of course such construction adds materially to the first cost.

TECHNICAL.

Manufacturing and Business.

The Bucyrus Steam Shovel & Dredge Co., of South Milwaukee, Wis., has recently received orders through its representative, Mr. E. H. Hipple, of Chicago, for three No. 1 40-ton shovels to be sent to the New York, New Haven & Hartford, and two No. 1 40-ton shovels for the Wisconsin Central.

The Standard Oil Co. has just commenced to equip about 4,000 cars of the Union Tank Line with the Westinghouse air brake.

The Interchangeable Brake Beam Co., of St. Louis, has opened an office at No. 206 Commercial Building, Chicago.

The Cooke Locomotive & Machine Co. is building three Rotary snow plows, one for the Erie, one for the Southern Pacific and one for the Union Pacific.

The Penn Bridge Company, of Beaver Falls, Pa., has recently taken contracts for a 70 ft. × 210 ft. addition to the 84 in. rolling mill of the Pittsburgh Reduction Co. at New Kensington, Pa., and an addition, 120 ft. × 180 ft., for the new works at Niagara Falls. Other contracts for structural iron work include a building for a gas producer plant for the Carbon Steel Co., of Pittsburgh, Pa., 310 ft. × 30 ft., and a warehouse for Union Iron & Steel Co. at Youngstown, O., 300 ft. × 70 ft. The Toledo & Ohio Central has ordered two 55-ft. turntables, and a 50-ft. turntable is being built for another company.

The Jerome metallic packing was specified on the 14 engines recently built by the Rogers Locomotive Works for the Chilian Government and also on the 24 engines recently ordered by the Chicago & North Western.

The Brown Hoisting and Conveying Machine Co., of Cleveland, O., has sold through its Chicago office a complete tram-rail system, to be installed in the new warehouses of the National Tube Works Co., of Chicago, this system to consist of the necessary steel I beams for the runway, switches, turntables, trolleys and triplex blocks, wrought-iron hangers, etc.

J. M. Atkinson and Henry L. Prather have been appointed agents in Chicago for the Fulton Truck and Foundry Co., of Mansfield and Cleveland, O.

The Lodge & Davis Machine Tool Co., of Cincinnati, is now employing 400 men and reports the demand for machine tools as having improved in the last few months with prospects that the improved business will last for many months.

The McGill Manufacturing Co. has just been organized in Chicago by Mr. David B. McGill, George F. McGill and others, to manufacture ticket punches.

Byran & McKibbin, 120 Broadway, New York, the general agents of the Buckeye Malleable Iron & Coupler Co., state that out of 19,000 "Little Giant" couplers (No. 4) in service, there have been only seven broken knuckles and two broken draw bars. The Columbus, Hocking Valley & Toledo, the Toledo & Ohio Central, the Vandalia line, and the Baltimore & Ohio Southwestern have been using the "Little Giant" coupler for over a year and report not a single breakage. The above information, they state, is up to date.

The Billmyer & Small Company, of York, Pa., is working on an order of 20,000 grabirons to be shipped to a car firm which is being pushed with work.

The Huntingdon Car & Wheel Works, in Huntingdon, Penn., which have been idle for three years past, were purchased this week by W. A. Obyon, of Savannah, Ga., for a syndicate of Southern capitalists. The new firm will employ about 500 men and will manufacture electric street cars principally.

The Automatic Dumping Coal Car Co., of New York City has been organized to manufacture devices for opening and closing doors of coal and other cars. The directors are Nathan Barney and George D. Barney, of Brooklyn, and Henry W. Hayden, of New York City.

The Penn Steel Casting Co., Chester, Pa., has received one of the largest contracts for steel castings ever given out in this country, from the Baldwin Locomotive Works. The order comprises 280 driving wheel centers of about 3,000 lbs. each.

The Pittsburgh Reduction Co. intends to enlarge its plant at New Kensington. The new addition will be a finishing mill of large size.

The Cooke Locomotive Machine Co., of Paterson, N. J., has appointed Bryan & McKibbin, of 120 Broadway, New York, its general agents.

New Stations and Shops.

The Wilbraham-Baker Blower Co., of Philadelphia, has placed the order for a new pattern storehouse, 64 ft. × 86 ft., with the Berlin Iron Bridge Co. The building will be one story high, with brick sidewalls.

The erecting department of the Chesapeake & Ohio shops at Huntington, W. Va., which was recently destroyed by fire here, will be rebuilt at once This department employs about 400 men. The contract for the building has already been let.

The General Electric Co. is building a new machine shop 92 ft. × 350 ft at Schenectady, N. Y. Two galleries will run the entire length of the shop and there will be an annex 50 ft. × 80 ft. The latter will be used for general machine work, the main floor of the larger building for testing and as an erecting shop, and the galleries will be used for erecting light apparatus.

General Manager George A. Burt, of the Ohio River road, announces that the company will build a new station at Sistersville, W. Va. Since the finding of oil at Sistersville, the town has grown to be the most important station on the line of the Ohio River road.

The Philadelphia & Reading is arranging for the erection of two large warehouses to occupy the site of the old station and train sheds at Broad and Callowhill streets, Philadelphia. Bids are now being received for the work. The new buildings will be built from the grade of the proposed subway, and will be 10 stories high. At Nineteenth and Callowhill streets a third warehouse, also of large size, is to be erected, also on the subway grade. All the structures will be modeled somewhat after the present warehouse, at Sixteenth and Callowhill streets.

Plans are being prepared for building a new freight house at Atlanta, Ga., by the Seaboard Air Line. Under an agreement with the Western & Atlantic road, this station will be jointly used by the two roads. The Western & Atlantic gives the Seaboard Air Line free service over its tracks into Atlanta. The new building will be built in the center of the city on property purchased some time ago. The site is about 900 ft. long and from 150 to 200 ft. wide, and is within two blocks of the Kimball House.

The Pennsylvania has invited bids for the erection of a new brick freight station 40 ft. × 200 ft. in Johnstown, Pa.

Iron and Steel.

It is announced that the Pennsylvania and Maryland steel companies will start the furnaces at the Sparrow's Point plant in a few days. The works have been closed since the appointment of the receivers for the steel companies over a year ago.

The Aschman Steel Casting Co., of Sharon, Pa., has completed improvements at its plant and added additional machinery. The buildings were burned about two years ago.

The property of the Mahoning Rail Mill Co., at Danville, Pa., consisting of rolling mill, machine shops, foundry, machinery, etc., is to be sold at Danville on Dec. 5, by Mr. A. S. Patterson, receiver.

The Reading (Pa.) Iron Co. has begun the erection of a new furnace with a capacity of 650 tons weekly at Emaus.

Last week the output at the South Steel mill of the Lackawanna Iron & Steel Co., Scranton, was the largest in the history of the mill; it footed up 6,398 tons. One night shift turned out 653 tons.

The Government Timber Tests.

The following resolution was adopted by the Association of Railway Superintendents of Bridges and Buildings at the fifth annual convention at New Orleans Oct. 15, 1895:

WHEREAS, A most comprehensive and valuable series of investigations into the properties of wood and tests of the strength of our commercial timbers has been carried on in the Division of Forestry of the United States Department of Agriculture;

WHEREAS, These investigations have already demonstrated that a most decided improvement in the practice with timber structures and use of wood and a saving of millions of dollars' worth of wood material are attainable as a result of these investigations; be it

Resolved, That we, the American International Association of Railway Superintendents of Bridges and Buildings, assembled in regular session, at our fifth annual convention, at New Orleans, La., Oct. 15, 1895, indorse, as railroad officials in charge of the construction and maintenance of timber structures and buildings of railroads throughout the United States, the work thus inaugurated by the United States Government as tending toward a most needful and rational economy of our forest resources and desirable improvements in their use, resulting not only in a great saving to users of timber throughout the country, but especially offering a valuable guarantee for the absolute safety of properly designed timber structures;

Resolved, further, that we ask our representative in Congress to make liberal appropriations for the continuance and more rapid advance of this work, in order to secure, as quickly as possible, the much needed information, believing that the government alone is in a position to secure it, and that it is true economy to provide it without delay.

Resolved, further, that these resolutions be transmitted to the President of the Senate, the Speaker of the House of Representatives, the Secretary of Agriculture, the Chairman of the Committee on Agriculture of the Senate, and the Chairman of the Committee on Agriculture of the House of Representatives.

Russian Armor Contract.

It was reported last week that the Carnegie Steel Co. had been awarded the contract for 1,100 tons of armor plate for the Russian Government. The armor will be of the same kind as that which was tested with admirable results at the Indian Head Proving Grounds some weeks ago, and is a patent carbonized re-forged armor of the Carnegie Company. It appears that the Carnegie Company made a second plate about the time it made the one for the United States Government, which was sent to Russia and tested there, with results the same as those at Indian Head. The order comes at a fortunate time for the Carnegie Company, just as the orders for armor for the United States Government were about completed, and when otherwise the great armor making plant of the company would have been shut down The present order will keep it in operation for about five months.

The Boston Subway.

The contracts for the third section of the subway were awarded by the Boston Transit Commissioners last week. Mr. Fred T. Shaw, of Providence, was awarded the contract for building this section at his bid of $177,226, the lowest bid received for that portion of the work. The bids for the steel work for the third section were rejected and new bids were called for which were opened on Oct. 24. The Pennsylvania Steel Co. was then awarded the contract for the steel work at $49.88 a ton. This company thus secures the contract for all the steel work so far ordered for the subway. Each section of the subway proper has been awarded to different contractors. Jones & Meehan, of Boston, and E. W. Everson, of Providence, are building the first and second sections respectively.

Steel Works for Russia.

We have from excellent authority the news that Mr. Gustav Hartman, President of the Saxon Manufacturing Company, and the International Bank at St. Petersburg, have secured the contract to build very large works in the south of Russia, at Lugausk. This plant will consist of a Martin steel mill, a rolling mill for steel plates, angle iron, etc.; a rolling mill for copper plates, a boiler tube works, large boiler shop and complete locomotive works. They have a four and a half million dollar contract with the Russian Government for locomotives, tubes, copper plates, etc.

The Diamond Shoal Light.

It appears that the plans for a lighthouse to be built on the Diamond Shoal, off Cape Hatteras, have been approved and an engineer officer has started on a tour among the steel works with reference to placing the contract. It is proposed to build a skeleton structure, resting on tubes, to be sunk in the sand. The height of the plane of light will be about 100 ft. above the water and the structure will stand in 30 ft. of water. The diameter of the base will be about 60 ft. Presumably, the reader is somewhat familiar with the repeated efforts that have been made to build a lighthouse at this spot, which, considering the heavy seas and the treacherous foundation, is perhaps the most difficult place in the world at which a lighthouse has ever been attempted. Indeed there is a very strong party in the Lighthouse Board which advocates the use of a lightship, which would cost perhaps not more than one-tenth of the sun that would be necessary for a lighthouse.

THE SCRAP HEAP.

Notes.

Western New York & Pennsylvania has purchased 32 acres of land at Ebenezer, near Buffalo, which it will lay out for freight yards.

Ex-Senator George F. Edmunds has been engaged by the Government as special counsel in the habeas corpus suit of Thomas F. Brown, Auditor of the Allegheny Valley.

The Southern Pacific has given notice that after Dec. 1 it will refuse cars which are not equipped with grab irons according to law, and after Feb 15, 1896, will refuse cars in which the drawbars are not at the standard height.

The drought in the Ohio Valley continues, and there is now great anxiety about the coal vessels lying at Pittsburgh. At Cincinnati, on Oct. 24, the height of water in the river was 2 ft. 4 in., the lowest stage since 1881. The drought is severe in many other parts of the country. The Carolina Central Railroad has great difficulty in supplying its locomotives with water between Charlotte and Wilmington.

A train of 7 sleeping cars weighing 455,000 lbs. was run over the Pennsylvania from Jersey City to Philadelphia, 89 miles, on Oct. 24, in 1 hour 33 minutes, or at the rate of 62 miles an hour. The train was drawn by a Class P engine, No. 1651. It was an experimental train, and there were no passengers. The train made a stop of 3 minutes to take water, the attempt to scoop water at Monmouth Junction having failed.

The Philadelphia street railroads on which, for a year or two, the cars have been making stops just before instead of just after crossing transverse streets, have announced that after Nov. 15 the old practice will be resumed; that is, the stops to take and leave passengers will be made at the far side instead of at the near side of cross streets. Where a cross street is occupied by a track, the cars will make a crossing-stop on the near side of the street. This is for safety, and not for the purpose of discharging or loading passengers.

On Sunday last the Western Union Telegraph Company worked a wire through from New York City to the top of Pike's Peak, General Eckert, President of the company, being at the latter place. This is published in the daily papers as an interesting item of news, though the manager of the Western Union office in this city informs us that long circuits are now commonplace on the lines of that company. The Pike's Peak circuit was worked on one side of a quadruplex between New York and Denver, with repeaters at Buffalo, Chicago and Omaha.

Lake Notes.

The total iron ore shipments for the year from upper lake ports are expected to aggregate 9,500,000 gross tons. The total shipments by lake and rail in 1892 were 9,072,241 tons. Insurance policies on A1 vessels this year extend to Dec. 10.

The rates on ore from Lake Superior have fallen slightly from the basis prevailing during the past few weeks and now stand at aboue $1.75 from Duluth. Grain has also dropped a trifle. Prospects up to about this week remained bright and the vessels were making numerous profits which compensate them for the the dullness of previous seasons, but on Monday 43 large vessels were detained in Lake St. Clair on account of the low water at the outlet; and the prospects are now such as to cause a good deal of anxiety.

The Car Ferries Across Lake Erie.

The second car ferry built by the Craig ship building firm, of Toledo, O., for the Pittsburg, Shenango & Lake Erie to be used in the lake trade between Conneaut and Dover, Ont., was successfully launched on Oct. 24. These boats are 300 ft. long by 52 ft. wide and 54 ft. high to top of pilot house. They will carry 26 34-ft cars loaded with 30 tons each on a draft of 12 ft. Shennago No. 1, the first of these boats, has been in servicethis summer, is crossing Lake Erie between Port Dover and Conneaut, O., making an average speed across Lake Erie of 13½ miles an hour.

A Long Electric Road for Buffalo.

The Buffalo Traction Co. was incorporated in New York this week to construct a street surface railroad 66 miles in length, to be operated by electricity. The road is to be constructed from the Buffalo city line, at South Park, and from the city ship canal in the Hamburg turnpike to the Buffalo city line in O'Neill street, and across the city of Buffalo to the town of Checktowaga. The directors are E. G. S. Miller, Joseph B. Mayer, Leonard B. Crocker, Washington Bullard and Herbert P. Bissell, of Buffalo; T. L. Johnson, of Cleveland, O.; Richard Ladenburg, John K. Page and Louis Kahn, of New York.

The Cramps to Build a Steamer for the Southern Railway.

The Southern Railway Co. has contracted with the Cramps Shipbuilding Works for a steel passenger steamship to ply between Norfolk and Baltimore. The new vessel will be 242 ft. long and 42 ft. beam and will have accommodations for a hundred passengers.

The Hennepin Canal.

Work has been suspended on the line of the Hennepin Canal, according to a press dispatch, with the exception of two forces on the extreme eastern end, and these will be laid off on Nov. 10. This action was taken because the appropriations have been about exhausted; eight miles of the canal on the western end have been completed. On the eastern end the excavations for 20 miles have been made, and seven locks have been finished. A small fund yet available will be used for the purchase of rights of way.

The New Ferry of the Pennsylvania at New York.

Plans have just been completed for the Pennsylvania's new ferry house and passenger station at Twenty-second street, New York City, and it is expected that this new uptown ferry from Jersey City will be in operation by Jan. 1. The ferry house will be a handsome structure and will be two stories high to accomodate the double-deck ferryboats. It will have waiting rooms on both floors and elevators for passengers. New double-deck ferry boats are being built which will be faster than those now in service. When the new ferry route is in operation with the new boats it is expected that there will be a saving of 40 minutes between the Broad Street Station, Philadelphia, and Madison Square, New York City.

CAR BUILDING.

The Central of New Jersey will order 1,000 cars shortly.

The Detroit & Mackinac road will probably soon be in the market for both passenger and freight cars.

The Chicago, Fort Madison & Des Moines has placed an order for 12 box cars with the Wells & French Car Co.

The Burlington, Cedar Rapids & Northern has just placed an order for 100 box cars with the Wells & French Co.

The Duluth & Iron Rangé has placed an order with the Duluth Manufacturing Co., of Duluth, Minn., for 25 box cars.

The Chicago, Milwaukee & St. Paul is to build 800 new freight cars, nearly all of them at the shops of the company in West Milwaukee.

The Pullman Palace Car Co. received orders this week for 400 cars from the Pennsylvania Co., and 200 cars from the Gulf & Interstate road of Texas.

It is reported that the Pennsylvania will shortly order about 50 new day passenger coaches for use on the Pittsburgh, Cincinnati, Chicago & St. Louis road.

The Lehigh Valley road this week awarded the contract for building the 2,000 cars previously noted in this column. The United States Car Co. secured the order for building 1,000, and the other 1,000 were equally divided between the Buffalo Car Manufacturing Co. and the Union Car Co., of Depew, N. Y.

LOCOMOTIVE BUILDING.

The Duluth & Iron Range has given the Baldwin Locomotive Works an optional contract for 10 heavy locomotives The option is to hold until December when it will in probability be closed.

The Cooke Locomotive & Machine Co, of Paterson, N. J., has just delivered to the Oregon Railway & Navigation Co. four 10-wheel locomotives with cylinders 19 in. × 24 in., and one switching engine with cylinders 18 in. × 24 in.

BRIDGE BUILDING.

Annapolis, Md.—The county commissioners awarded the contract for building an iron bridge over Marley Creek to the Groton Bridge Co., of Groton, N. Y., for $1,025.

Beaver Falls, Pa.—The company applying for a charter for a bridge across the Beaver River, between this place and New Brighton, is the Overgrade Bridge Co., and the application will be filed on Nov. 18. The incorporators are J. G. Carcarn, Charles Connell, F. W. Patterson, D. D. Miller, Theodore Ortman and U. B. Beaumont. The bridge will have two decks. The lower deck will be used by the Pittsburgh & Lake Erie, and the Beaver Valley Traction Co. will use the upper deck.

Dunkirk, N. Y.—The City Clerk has been authorized to call for bids for erecting a bridge over Crooked Brook and for extending the present bridge on Railroad avenue.

Great Northern.—This road has begun work on two steel bridges to cross the Red River of the North, one at Fargo and the other at Grand Forks. Each is to cost about $85,000. The Fargo bridge will be 800 ft. long. These bridges will complete the change from wood to steel on the Great Northern east of the Red River.

Norristown, Pa.—The Court has approved the action of the Grand Jury in recommending the erection of the bridge over the railroad tracks and yards and Stony Creek at Airy street. This removes all opposition to the erection of this structure. It is to be of steel and to cost over $40,000.

Penn Bridge Co.—The company has recently taken contracts for the following bridge structures: Two steel bridges on cylinder piers for Hill County, Tex.; a 170-ft. highway span for Wetzel County, W. Va.; two 100-ft. spans and one 70-ft. span for Columbiana County, O.; highway span for town of Mosquito, Ill; one 125-ft. draw span for Messrs. M. S. Cartter & Co., of St. Louis, and a 100-ft. span on cylinder piers for Mitchell County, Tex.

Philadelphia.—The taxpayers of the 27th ward, residing in the neighborhood of 63d street and Woodland avenue, met last week to urge upon the City Councils the necessity of an appropriation for the projected bridge from Passyunk avenue to 63d street across the Schuylkill river, and a committee was delegated to act in the matter.

Pittsburgh, Pa.—The channel span of the new Brady street bridge was completed last week by the Schultz Bridge and Iron Co., which is erecting the structure. This span is 520 ft. long. The south side shore span, 260 ft. long, is the only span remaining to be built, and the material is all on the ground.

Sheffield, Pa.—The Philadelphia & Erie is erecting a new bridge over its tracks at the station here.

Sorel, Que.—The Railway Committee of the Dominion Privy Council has approved of the site of the new railroad bridge over the Richelieu at Sorel, and the work will be begun at once, Mr. McCarthy being engineer.

Stockton, Cal.—The directors of the San Joaquin Valley road have asked for piling, piers and bridge lumber for bridges and trestles over the Tuolumne River and the bed of Dry Creek. Chief Engineer Storey has issued specifications for the materials. The Tuolumne bridge will be 1,300 ft. long and 40 ft. high and will be a combination structure, with a long trestle on either side from the bank to the stream. The Dry Creek bridge will be about 800 ft. long with one long, span and trestle approaches. Builders are working on the Stanislaus River bridge, and also on the steel drawbridge in Stockton over Mormon Channel and other crossings over channels near that city. These structures include all the bridge work for 30 miles beyond Stockton.

Toledo, O.—The County Commissioners are to erect a new bridge across the canal at Otsego in Providence Township, and the plans are now being prepared by the County Surveyor, Joseph Hofman. The plans provide for a through span, single truss bridge, and have been approved by the State Engineer.

The new steel aqueduct to be built by the Lake Shore & Michigan Southern in Toledo to replace the present stone structure will probably be built this year instead of delaying the work until next year, as first proposed. The State Engineer, Mr. C. E Perkins, was in consultation with the railroad engineers in regard to the plans for the structure last week, and it is understood that these have been approved so far as made.

Wheeling & Lake Erie.—General Manager Blair announces that the directors have been authorized to make extensive improvements in the bridge structures throughout the length of the road. The plans formulated include the replacing of all the wooden bridges now existing with iron and steel structures.

Youngstown, O.—The County Commissioners, who control the bridges in the city, have decided to erect a bridge connecting the Fourth and Fifth wards, costing about $50,000. It will have tracks for street cars. The street car company will contribute largely toward the cost of the bridge.

RAILROAD LAW—NOTES OF DECISIONS.

Carriers of Goods and Injuries to Property.

In Arkansas the Supreme Court rules that an express company which has, by special contract with the consignor, restricted its liability for liquors shipped by him C. O. D. to that of a warehouseman, while such liquors are in its possession for the purpose of collection and awaiting a demand for them by the consignee, is not liable to the consignor for their value because of their destruction by a mob of unknown men who had broken into its warehouse.[1]

In the Federal Court it is held that a railroad which makes a special contract to haul a train of private cars, containing the property, equipment and performers of a circus—it not being its usual business to haul trains of private cars, or to carry passengers, animals and freight on the same train—acts as a private carrier, in making such contract, and a stipulation therein against liability for damage is valid and binding.[2]

In Texas it is held that a railroad is bound to furnish a suitable car for the transportation of freight, and is not relieved of such liability because the shipper examined the car, and did not object to its fitness.[3]

In Kentucky, in an action for delay in transporting a carload of cattle it appeared that when the car reached defendant's stock yards it should have been attached to a fast freight train, which would have landed it at its destination early Monday morning. The conductor refused to attach the car, because the connecting road had not sent a waybill, though plaintiff showed him the bill of lading. The car was afterwards fastened to a local freight train, and did not reach its destination till Tuesday at 11 a. m. It is held that plaintiff was entitled to damages.[4]

In New York it is ruled that a carrier to which fruit was delivered for shipment when the temperature was below freezing point is not negligent in forwarding the fruit on the day of receipt, instead of retaining it in storage until warmer weather.[5]

In Pennsylvania it is held by the Supreme Court that a provision in a bill of lading that "the amount of any loss or damage . . . shall be computed at the value of the property at the place and time of shipment, . . . unless a lower value has been agreed on," is void, as against public policy, in case of loss caused by negligence; the effect of the stipulation being not alone the avoidance of inconvenience and uncertainty in the demand for damages, but a reduction in the real loss.[6]

In the Federal Court it is ruled that the fact that a local rate is higher than the corresponding part of a joint through rate does not prove unlawful discrimination.[7]

In Missouri it is held that a shipper of live stock is not estopped to complain of an injury to a shipment from the want of trapdoors in the roof of the car, as required by statute, by the fact that he knew at the time of loading the stock that there were no such trapdoors.[8]

In Pennsylvania it is laid down that a stipulation in a bill of lading that the owner, shipper, and consignee severally shall cause the goods to be insured, and that in case of loss the carrier shall have the benefit of the insurance, if such loss "shall occur from any cause which shall be held to render this line or any of its agents liable therefor," is a contract intended to protect the carrier against the consequences of its own negligence, and is void.[9]

In Texas it is held that where a railroad transports cattle within a reasonable time, it is not liable because the cattle did not reach their destination at the time designed by the shipper, unless, when it received the cattle, it was notified of the shipper's design.[10]

In Kansas it is ruled that where the contract by a carrier for a special rate of freight is void because in violation of the interstate commerce act, the carrier may collect the usual rate.[11]

Injuries to Passengers, Employees and Strangers.

In Texas a woman sued for damages due to mortification caused by her becoming locked in the water-closet of a passenger car on account of a defect in the door lock. It appeared that the lock was of the best manufacture, and that, as soon as plaintiff's predicament was discovered, plaintiff, while the brakeman was attempting to pry off the lock, voluntarily escaped from the

closet through the window, with her husband's assistance. The Supreme Court holds the railroad not liable.[12]

In Pennsylvania where a passenger on a street car makes a timely request for a transfer check, but it is not issued to him until just as he is leaving the car, he is not bound by a condition therein making it his duty to examine the date, etc., and see that the same are correct.[13]

In Georgia where a passenger demands his baggage on the arrival of the train, and is told he cannot get it until the following morning, the carrier is liable if it is destroyed by fire during the night.[14]

In Missouri a porter of a palace car, whose duties are to collect fares and wait on passengers in such car, is entitled to the rights of a passenger, in respect of the careful running and management of the train.[15]

In Texas where a train is derailed by an animal wounded by a preceding train, and left on or near the track, the company is chargeable with negligence.[16]

In North Carolina it is held by the Supreme Court, that, where a passenger, after being warned by the conductor not to do so, entered a car standing at the usual place at a station, and open so as to receive passengers, and which was designed for the train on which he was about to leave, but which was not then coupled to said train, he was guilty of contributory negligence as to any injury sustained by him by reason of boarding said car.[17]

In New York it is held that, the trainmen of a railroad which runs its trains over the road of defendant company, under a contract by which defendant's superintendent arranges all the time tables and controls the conductors of the other company, are not fellow servants with defendant's employees, though the same person is general manager of both roads, and one person is superintendent of both on the division where the accident occurred.[18]

In Texas it is held that, a brakeman who, while properly on the ladder of a freight car, is knocked off by cars left on a side track too close to the main track, may recover, though the cars were so left through a fellow servant's negligence, when it appears that he could have escaped the danger but for the absence of a hand hold above the ladder, by which to climb to the top of the car.[19]

In New York, plaintiff, an employee in defendant's repair yards, received injuries while detaching a bumper spring from under a car standing on a track on which the rules of the company forbade any work to be done. The company provided regular tracks, on which repair work could be done without danger from moving cars, and the track in question was unprotected from such cars; and plaintiff was injured through the moving of the car under which he was working by the contact of another car. Plaintiff, in working there, was acting under the direct orders of a boss whose orders he was bound to obey. The Court of Appeals holds that defendant was not liable, in the absence of evidence that it had authorized such boss to change the regular rules of the company as to the place where repair work should be done.[20]

In Texas an employee of a railroad who, in obedience to an order of the company, travels in the caboose of a freight train to reach a point where he had been assigned to work, but who takes no part in the running of the train, is not a fellow servant of the engineer of the train.[21]

In Indiana it appeared that deceased was employed to work on the side tracks of defendant at a point near which defendant had a pump house, and that it was the custom of defendant's employees at work at that point to eat their dinners in the house, it being the only place in which they could keep warm. The time given deceased for his dinner was so short that he was unable to go home, and defendant never objected to its employees using the pump house during dinner time. Deceased, while eating his dinner in the pump house on a very cold day, was killed by an escape of steam, resulting from defects in a boiler in the house. The Supreme Court holds that the defendant was liable.[22]

In New York, it is ruled by the Supreme Court that where defendant's station agent was instructed to open the switch for a certain morning train, and was furnished with a key of the switch for that purpose, but was told that the trainmen of the other trains would operate the switch for their respective trains, and he opened the switch for a night train, by which a collision was caused, it is a question for the jury whether the station agent was acting within the scope of his employment; the test being not whether a servant acted in accordance with his instructions, but whether the act was done in the execution of the master's basiness.[23]

In the Federal Courts a railroad which buys a locomotive from reliable builders discharges its duty by applying ordinary tests to determine its strength and efficiency, and is not bound to employ experts or apply the highest tests.[24]

In Massachusetts, plaintiff, while using due care, was injured by the breaking of a rotten stake used to hold a load upon a platform car and assist brakemen in crossing from car to car. The Supreme Court holds that the defendant railroad company was liable, though there was evidence that it had furnished sound lumber for stakes and men to prepare them.[25]

In Texas, plaintiff, a locomotive fireman, was injured by the explosion of a glass lubricator. It was shown that all similar lubricators were provided with shields when received from the manufacturers, but that the railroad operatives had generally discarded the shields, and that the shield had been taken from the one causing the injury. Plaintiff had for several months used similar unprotected lubricators, and assisted in putting such lubricator in place. The Supreme Court rules that plaintiff could not recover.[26]

In Minnesota it is held by the Supreme Court that the statute requiring railroads to block frogs in their yards and terminal stations, does not render them liable to a trespasser for injuries resulting from a failure to comply therewith.[27]

In New York deceased was a car cleaner on defendant's elevated railroad yards, and was killed by stepping backward from a car at night and falling through an opening in the structure on which the tracks were laid. It was shown that the structure was new and not yet finished; the deceased had been there daily for three weeks in the capacity of watchman and car cleaner; saw carpenters at work planking the structure and knew its condition. The Court of Appeals holds that defendant was not liable.[28]

The Supreme Court of Missouri holds that the statute making it a misdemeanor for any person to climb upon, hold to, or in any manner attach himself to a locomotive or car while in motion, or while running in or from any city or town, precludes recovery of damages by a child six years of age who is injured while stealing a ride on a car going through the railroad company's freight yard.[29]

In Texas it is held that a railroad is liable for injury to mind and body, ensuing from nervous shock and fright, caused by negligently running its cars off a switch into plaintiff's yard, and within a few feet of her house, though plaintiff was not actually touched.[30]

In Mississippi it appeared that deceased, after seeing an engine pass her on a side track, which had been used by the public as a pathway for 26 years, in the direction of two cars, walked on the track in the direction from which the engine came, without looking to see what became of it. After coupling to the cars the engine backed, and while going at the rate of from two to four miles an hour, ran over deceased. The Supreme Court rules that she was guilty of contributory negligence.[31]

In Texas, deceased, on coming out of a depot in the early morning, while it was yet dark, and making for a street car, stepped from the sidewalk parallel to defendant's road, in front of a moving car, detached from the engine, which set it in motion at a speed forbidden by ordinance, and was killed. The Supreme Court holds that defendant is liable, though deceased did not look before going upon the track.[32]

In Georgia it is laid down, that, as to a person who, without license, is walking on a railroad track on a trestle, situated between a whistling post and a public crossing, the omission of the engineer to comply with the statutory requirements as to blowing the whistle and checking the speed of the train is not negligence, as these requirements raise no duty as between the company and strangers who may be on the track elsewhere than at a public crossing.[33]

In Missouri, it is held that a railroad whose road runs through a village where persons or stock are likely to be on the track must run its trains in the village at such a speed as to be able to avoid injury to persons or property, though there is no village ordinance on the subject.[34]

[1] Pac. Exp. Co. v. Wallace, 29 S. W. Rep., 32.
[2] C., M. & St. P. v. Wallace, 66 Fed. Rep., 506.
[3] Hunt v. Nutt, 27 S. W. Rep., 1031.
[4] L., N. A. & C. v. Brinley, 29 S. W. Rep., 305.
[5] Tucker v. P. R. R., 32 N. Y. S., 1.
[6] Ruppel v. A. V., 31 Atl. Rep., 478.
[7] Parsons v. C. & N. W., 63 Fed. Rep., 903.
[8] Paddock v. M. P., 1 Mo. App. Rep., 87.
[9] Willock v. Penn., 30 Atl. Rep., 948.
[10] A., T. & S. F. v. Bryan, 28 S. W. Rep., 98.
[11] C., R. I. & P. v. Hubbell (Kan.), 38 Pac. Rep., 266.
[12] G., C. & S. F. v. Smith, 30 S. W. Rep., 361.
[13] Laird v. Pittsburgh T. Co., 31 Atl. Rep. 51.
[14] G. R. & B. Co., v. Phillips, 20 S. E. Rep., 646.
[15] Jones v. St. L. S. W., 28 S. W. Rep., 883.
[16] Mex. Cent. Ry. v. Lauricella, 28 S. W. Rep., 277.
[17] Tillett v. Lynch. & D., 20 S. E. Rep., 480.
[18] Tierney v S., B. & N. Y., 32 N. Y. S., 627.
[19] Int & G. N., v. Sipole, 29 S. W. Rep., 688.
[20] Keenan v. N. Y., L. E. & W., 39 N. E. Rep., 711.
[21] G., H. & S. A. v. Norris, 29 S. W. Rep., 950.
[22] C., C., C. & St. L. v. Martin, 39 N. E. Rep., 759.
[23] Tierney v. S. B. & N. Y., 32 N. Y. S., 627.
[24] Clyde v. R. & D., 65 Fed. Rep., 482.
[25] McIntyre v. B & M., 39 N. E. Rep., 1,012.
[26] T. & N. O. vs. McKee, 29 S. W. Rep., 544.
[27] Akers v. C., St. P., M. & O., 60 N. W. Rep., 669.
[28] Kennedy vs. Manhattan, 39 N. E. Rep., 956.
[29] Barney vs. H. & St. J., 28 S. W. Rep., 1069.
[30] Yoakum vs. Kroeger, 27 S. W. Rep., 953.
[31] Ill. Cent. vs. Lee, 16 South Rep., 349.
[32] Int. & G. N. v. De Bajligethy, 28 S. W. Rep., 829.
[33] A. & C. Air-Line. v. Gravitt, 20 S. E. Rep., 550.
[34] Campbell v. M., K. & T., 1 Mo. App. Rep., 3.

MEETINGS AND ANNOUNCEMENTS.

Dividends.

Dividends on the capital stocks of railroad companies have been declared as follows:

Baltimore & Ohio, Washington Branch, 5 per cent., payable Nov. 1.

Boston & Maine, quarterly, $1.50 per share on the common stock, payable Nov. 15.

Great Northern, quarterly, 1¼ per cent. on the preferred stock, payable Nov. 1.

Lake Erie & Western, quarterly, 1¼ per cent. on the preferred stock.

Nashville, Chattanooga & St. Louis, 1 per cent., payable Nov. 1.

Stockholders' Meetings.

Meetings of the stockholders of railroad companies will be held as follows:

Baltimore & Ohio, annual, Baltimore, Md., Nov. 18.

Buffalo, Rochester & Pittsburg, annual, 36 Wall street, New York City, Nov. 18.

Illinois Central, special, Chicago, Nov. 26 to authorize a capital of $10,000,000 for the capital stock.

Manhattan Railway Company, annual, New York City, Nov. 13.

New Orleans & North Eastern, annual, New Orleans, Nov. 6.

New York, Lake Erie & Western, annual, 21 Courtlandt street, New York City, Nov. 26.

Technical Meetings.

Meetings and conventions of railroad associations and technical societies will be held as follows:

The Society of Naval Architects and Marine Engineers will hold its third general meeting at the house of the Amer. Soc. of Mech. Engineers, 12 West Thirty-first street, New York City, beginning at 10 a. m., Nov. 7, 1895.

The Engineers' and Architects' Association of Southern California meets each third Wednesday of the month in the Hall of the Chamber of Commerce, Los Angeles, Cal.

The Engineers' Society of Western New York holds regular meetings the first Monday in each month, except in the months of July and August, at the Buffalo Library Building.

The *Western Railway Club* meets in Chicago on the third Tuesday of each month, at 2 p. m.

The *New York Railroad Club* meets at the rooms of the American Society of Mechanical Engineers, 12 West Thirty-first street, New York City, on the third Thursday in each month, at 8 p. m.

The *New England Railroad Club* meets at Wesleyan Hall, Bromfield street, Boston, Mass., on the second Wednesday of each month.

The *Central Railway Club* meets at the Hotel Iroquois, Buffalo, N. Y., on the second Friday of January, March, May, September and November, at 2 p. m.

The *Southern and Southwestern Railway Club* meets at the Kimball House, Atlanta, Ga., on the third Thursday in January, April, August and November.

The *Northwestern Railroad Club* meets at the Ryan Hotel, St. Paul, on the second Tuesday of each month, at 8 p. m.

The *Northwestern Track and Bridge Association* meets at the St. Paul Union Station on the Friday following the second Wednesday of March, June, September and December, at 2.30 p. m.

The *American Society of Civil Engineers* meets at the House of the Society, 127 East Twenty-third street, New York, on the first and third Wednesdays in each month, at 8 p. m.

The *Western Society of Engineers* meets on the first Tuesday in each month, at 8 p. m. The headquarters of the society are at 1736-1739 Monadnock Block, Chicago. The business meetings are held on the first Wednesday at its rooms. The meetings for the reading and discussion of papers are held on the third Wednesday at the Armour Institute, Thirty-third street and Armour avenue.

The *Engineers' Club of Philadelphia* meets at the House of the Club, 1122 Girard street, Philadelphia, on the first and third Saturdays of each month, at 8 p. m.

The *Boston Society of Civil Engineers* meets at Wesleyan Hall, 36 Bromfield street, Boston, on the third Wednesday in each month, at 7.30 p. m.

The *Engineers' Club of St. Louis* meets in the Missouri Historical Society Building, corner Sixteenth street and Lucas place, St. Louis, on the first and third Wednesdays in each month.

The *Engineering Association of the South* meets on the second Thursday in each month, at 8 p. m. The Association headquarters are at The Cumberland Publishing House, Nashville, Tenn.

The *Engineers' Society of Western Pennsylvania* meets in the Carnegie Library Building, Allegheny, Pa., on the third Tuesday in each month, at 7.30 p. m.

The *Technical Society of the Pacific Coast* meets at its rooms in the Academy of Sciences Building, 819 Market street, San Francisco, Cal., on the first Friday in each month, at 8 p. m.

The *Association of Engineers of Virginia* holds informal meetings on the third Wednesday of each month, from September to May, inclusive, at 710 Terry Building, Roanoke, at 8 p. m.

The *Denver Society of Civil Engineers* meets at 36 Jacobson Block, Denver, Col., on the second and fourth Tuesdays of each month except during July, August and December when they are held on the second Tuesday only.

The *Montana Society of Civil Engineers* meets at Helena, Mont., on the third Saturday in each month, at 7.30 p. m.

The *Engineers' Club of Minneapolis* meets in the Public Library Building, Minneapolis, Minn., on the first Thursday in each month.

The *Canadian Society of Civil Engineers* meets at its rooms, 112 Mansfield street, Montreal, P. Q., every alternate Thursday, at 8 p. m.

The *Civil Engineers' Club of Cleveland* meets in the Case Library Building, Cleveland, O., on the second Tuesday in each month, at 8 p. m. Semi-monthly meetings are held on the fourth Tuesday of each month.

The *Engineers' Club of Cincinnati* meets at the rooms of the Literary Club, No. 24 West Fourth street, Cincinnati, O., on the third Thursday in each month, at 7.30 p. m. Address P. O. Box 333.

The *Engineers' and Architects' Club of Louisville* meets in the Norton Building, Fourth avenue and Jefferson street, on the second Thursday each month at 8 p. m.

The *Western Foundrymen's Association* meets in the Great Northern Hotel, Chicago, on the third Wednesday of each month. S. T. Johnston, Monadnock Block, Chicago, is secretary of the association.

The *Association of Civil Engineers of Cornell University* meets on Friday of each week at 2:30 p. m., from October to May, inclusive, at its association rooms in Lincoln Hall, Ithaca, N. Y.

Switchmen's Union of North America.

This body, organized by men who had formerly been members of the Switchmen's Mutual Aid Association, held a convention at Omaha Oct. 18 and 19. D. D. Sweeney, of Jersey City, N. J., was elected Grand Master and John Daugherty, of Kansas City, Secretary. The next national convention will be held at Pittsburgh.

Southern & Southwestern Railway Club.

The next meeting of this club, to be held in Atlanta Nov. 21, is to be a special Exposition meeting. A great number of invitations are being sent out to railroad men all over the country, and it is believed that a very large attendance will be secured, and that a meeting of special interest and importance will result.

Master Car Builders' Association.

The Committee on Location of Air-Brake Cylinders on Freight Cars has sent out a circular of inquiry containing the following questions:

1. What in your opinion is the best location for air-brake cylinders and reservoirs on following classes of cars, having in view easy access for cleaning and repairing, as well as protecting air-brake apparatus as much as possible in case of derailments: Hopper bottom coal cars, box and stock cars, drop bottom gondolas, straight bottom gondolas?

2. Do you recommend that cylinder be located low enough so that rods will clear needle beams, or do you recommend cutting passage through needle beams for rods?

3. Do you consider it an advantage in regulating the braking power to have the rod from the cylinder lever to truck lever stand parallel with the car? Also, give your opinion as to the necessity for having the rod between the cylinder and floating lever stand in a line parallel with the car.

4. What distance would you recommend between needle beams and cylinders to give easy access for repairs and cleaning? What distance between triple valve and needle beam?

5. What in your opinion is the best practice in applying release valves on coal cars?

6. Has your experience demonstrated whether the water dropping on apparatus after passing through the coal on coal cars has any damaging effect on the brake apparatus by reason of the chemical properties in the coal?

7. Please give drawing, sketch or any other information on the subject which in your opinion might aid the committee.

Answers are to be sent to the chairman of the committee, James McBeth (N. Y. C. & H. R.), East Buffalo, N. Y.

Society of Naval Architects and Marine Engineers.

The third general meeting of the Society of Naval Architects and Marine Engineers will be held in New York City, beginning 10 a. m., Nov. 7, the sessions continuing through the 7th and 8th. Meetings will be held at the house of the American Society of Mechanical Engineers, 12 West Thirty-first street. On the evening of Friday, Nov. 8, there will be a banquet at the Hotel Brunswick for members and their guests. Any information desired can be obtained by addressing Mr. W. L. Capps, Secretary and Treasurer, 1814 K street, Washington, D. C. The papers and their authors are as follows:

Thursday.

American Maritime Development. By Capt. Henry C. Taylor, U. S. N., President Naval War College.

Performance of the Twin-Screw Steamer City of Lowell. By Prof. Jas. E. Denton, Stevens Institute of Technology.

Rudder Experiments—U. S. S. Monterey. By Elliot Snow, Assistant Naval Constructor, U. S. Navy.

Aluminum—its alloys and their use in ship construction. By J. C. McGuire, C. E.

Methods and Forms for Certain Ship Calculations. By D. W. Taylor, Naval Constructor, U. S. Navy.

The Number of Longitudinal Intervals in Ship Com-

putation, as Affecting the Accuracy of Integration for Displacement, and Note on the Relation between Reduced and True Wetted Surface. By Prof. W. F. Durand, Cornell University.

Friday.

Recent Designs of Vessels for the U. S. Navy. By Philip Hichborn, Chief Constructor, U. S. Navy.

Tactical Considerations Involved in War Ship Design. By Albert P. Niblack, Lieutenant, U. S. Navy.

The Centerboard—its influence on design, its value and its proper use. By Wm. P. Stephens.

Engineering Research in the Navy. By Prof. Wm. S Aldrich, University of West Virginia.

The Ventilation of Ships. By F. B. Dowst, M. E.

An Experimental Test of the Armored Side of U. S. S. Iowa. By Albert W. Stahl, Naval Constructor, U. S. Navy.

PERSONAL.

—Mr. Thomas A. Fitzpatrick has been appointed Superintendent of the Cheyenne & Northern road, which is now operated as a division of the Union Pacific, Denver & Gulf This is a new office, Mr. Fitzpatrick being promoted from Trainmaster.

—Mr. Elisha R Estes, a well-known civil engineer in Virginia, who surveyed the proposed Belt line in Lynchburg for the Richmond & Danville, died at the residence of his brother, in Pittsylvania County, last week, He had been in failing health for over a year.

—Mr. L. P. Smith, formerly of the New York & New England road, has been appointed General Superintendent of the Delaware, Susquehanna & Schuylkill road, vice Daniel Coxe, deceased. Mr. Smith assumed charge of the operation of the road on Nov. 1

—Mr. J. H. Simpson has been appointed Superintendent of Car Service of the Southern Railway, with office at Washington, D. C. Mr. Simpson was formerly Assistant to the General Manager of the Flint & Pere Marquette road when Mr. Baldwin, now Second Vice-President of the Southern Railway, was General Manager of that company.

—Mr. Haiden Miller, Division Freight Agent of the Southern Railway at Birmingham, Ala., having been appointed Assistant General Freight Agent of the Western system of that company, with headquarters at Atlanta. Lincoln Green, Chief Clerk to J. M. Culp, Traffic Manager at Washington, has been appointed to succeed Mr. Miller as Division Freight Agent at Birmingham.

—Mr. C. A. Clark, Assistant Treasurer for the receivers of the Northern Pacific, and Mr. M. P. Martin, Assistant General Auditor, have been appointed respectively Treasurer and Auditor for the Western Division of the road, which is under the jurisdiction of Receiver Burleigh, who was appointed by Judge Hanford, of the Washington Circuit. This appointment gives these officers charge of their respective departments over the entire road.

—The 76th birthday of Mr. Henry B. Plant, President of the Plant System of railroads and steamships and of the Southern Express Co., was celebrated at the Atlanta Exposition on Oct. 28 by a mass meeting, which was attended by large numbers of employees of the Plant railroads, who went to Atlanta by three special trains. There were speeches by the President of the Exposition, the Mayor of Atlanta and others. Mr. Plant addressed the railroad employees.

—Mr. William A. Fleming, Division Freight Agent of the Delaware, Lackawanna & Western, at Binghamton, N. Y., has been promoted to be Assistant Western Freight Manager, and will be located in Buffalo. He has been connected with the Lackawanna for about 15 years. A year ago he was a traveling freight agent and then was placed in the more important position from which he has just been advanced. The appointment is made for the purpose of lightening the exacting duties of Western Freight Manager Fell.

—Mr. George L. Lansing, Secretary of the Southern Pacific, has been away from his office for a number of weeks on account of serious illness, and it is thought to be doubtful if he is again able to take up his duties this year. He has been in poor health for more than a year past, growing steadily worse, but kept at his desk until finally forced to stop work altogether. President Huntington and the officers of the Southern Pacific Company have proposed a long sea voyage for Mr. Lansing. He will probably start on this journey as soon as he is able to travel and may remain away a year or more.

—Mr. Robert N. Gallaway, formerly Vice-President of the Manhattan Railway of New York, has been recommended as one of the new receivers of the Northern Pacific by the various conflicting interests. After Judge Lacombe of the United States Circuit Court had for the third time adjourned the hearing before him on an application for the acceptance of the resignations of Messrs. Oakes, Rouse and Payne and the appointment of new receivers, the counsel for the various contending interests met in New York to discuss the question whether or not receivers satisfactory to all interests could not be agreed upon. Mr. Gallaway was nominated by President Brayton Ives and he was accepted by all interests. It was also agreed to take united action in regard to the other receiverships. It is thought that Mr. Burleigh, of Seattle, who was appointed by Judge Hanford of the the Washington Circuit, will be one of the other receivers and that the third will be a resident of St. Paul.

ELECTIONS AND APPOINTMENTS.

Alabama Great Southern.—President Spencer announces the following appointments: H. C. Ansley, Treasurer (vice H. H. Tatem, resigned), and George S. Hobbs, Auditor (vice Chas. H. Davis, Comptroller, resigned), both with office at 1300 Pennsylvania avenue, Washington, D. C.

The following appointments in the auditing department have been made: F. H. Crump, Assistant Auditor; all labor and material reports, pay rolls, vouchers, bills and correspondence relating thereto will be addressed to the Assistant Auditor, Washington, D. C. J. J. Wingfield, Ticket Auditor; reports of ticket sales, excess baggage, conductors' cash fare collections and correspondence relating thereto will be addressed to the Ticket Auditor, Washington, D. C. H. W. Woolf, Freight Auditor; all freight reports, copies of way-bills and correspondence relating thereto will be addressed to the Freight Auditor, Washington, D. C. W. H. Scott, Chief Traveling Auditor; inspection of storehouse, shop and roadway accounts will be under the direction of the Chief Traveling Auditor, with office at Atlanta, Ga. J. F. Carroll, Traveling Auditor; inspection of station accounts will be under the direction of the Traveling Auditor, with office at Birmingham, Ala. These officers all hold similar positions on the Southern Railway.

Central Pennsylvania & Western.—B. C. Dias of, Williamsport, who has been connected with the Pennsylvania for sixteen years, has accepted a position with the above company as Assistant Superintendent. His headquarters will be at Milville, Pa.

Delaware, Susquehanna & Schuylkill.—L. P Smith, has been selected to succeed the late Daniel Coxe as Superintendent of the road.

Emporium & Mount Jewell.—The officers of this company just organized in Pennsylvania are: President, George J. Wolf; Directors, George J. Wolf, James George, Harry A. Jackson, Melvin G. Raub, Charles V. Dennis and Anthony G. McComb, all of Bradford, Pa.

Evansville & Terre Haute.—At a meeting of the stockholders of the company the following directors were elected: W. H. Tilford, John Hone, J. L. Lamson, H. M. Tilford, Edward N. Gibbs, John W. Sterling, W. H. Goady and Henry Sanger Snow, of New York, and H. C. Barlow, of Evansville. Frederick Roosevelt, W. H. Curtis and T. H. Wheeler, retired.

Grafton & Belington—At the annual meeting, held at Grafton, on Thursday of last week, the following directors were elected: A. Pearre and George F. Hawkes, Baltimore; John Bradshaw, J. W. Hamilton and Thomas E. Davis, Grafton, W. Va; J. E Hall and Freeman Elliott, of Philippi, W. Va. John Bradshaw was elected President, and A. Faure Secretary and Treasurer. The road extends from Grafton, W. Va., to Belington, W. Va., forming a connecting link between the Baltimore & Ohio and the West Virginia Central & Pittsburgh.

Great Northern—At the annual meeting last week three vacancies in the directorate were filled by the election of Henry W. Cannon, of New York, and the re-election of Sir Donald A. Smith, of Montreal, and Jacob H. Schiff, of New York. At the annual meeting of the St. Paul, Minneapolis & Manitoba Company, the old officers and directors were re-elected.

Koon's Run & Bridgeport.—At the regular annual meeting at Clarksburg, W. Va., last week, the following officers were elected: Directors, C. E. Manley, J. N. Wilkinson, J. A. Fleming, J. M. Shinn and P. M. Long; President, J. M. Shinn; Secretary and Treasurer, J. M. Shinn. This road extends from Everson, Harrison County, W. Va., to Bridgeport, W. Va., on the Baltimore & Ohio, 12 miles.

Pennsylvania.—Asheville Welsh, for three years past Assistant Supervisor at Spruce Creek, Pa., has been promoted to the post of General Manager of the Philadelphia belt line. Mr. Welsh is 38 years of age. He was formerly in the Altoona offices.

Rio Grande Southern.—The annual stockholders' meeting of this road was held in the offices of Receiver E. T. Jeffery, at Denver last week. The following Board of Directors was elected: R. T. Wilson, Arthur Coppell and George Coppell, of New York; Clarence Buckingham of Chicago. This board will hold its meeting for the purpose of electing officers for the ensuing year this month.

Rumford Falls & Rangeley Lakes.—At the annual meeting in Portland, the following directors were elected: Galen C. Moses, of Bath, Me.; Hugh J. Chisholm, Charles A. Brown, E. B. Dennison, W. W. Brown, of Portland; F. H. Twitchell, of Bath; Edw. Plummer, of Lisbon; W. H. Newell, of Lewiston; Frank Guttman, of Lewiston Me.

Southern Railway—H. B. Hodges has been appointed Superintendent of Tests, with office at 1300 Pennsylvania avenue, Washington, D. C. Vice-President Baldwin defines his duties as follows: The Superintendent of Tests will provide specifications for and have charge of the inspection of all supplies, except ties and lumber, purchased for the various departments of the system, and will arrange for such mechanical and chemical tests as may be necessary to insure the fitness of the material for service. He will send his reports of such inspections and tests to the General Storekeeper, and no new material purchased under specifications shall be issued unless accepted by the Superintendent of Tests. He will conduct all investigations of and experiments with new devices and appliances referred to him for this purpose by heads of departments, including such tests as are made in the company's laboratories, as well as in actual service on the road, and will furnish the results of such investigations to officers interested. He will investigate, when requested, the failures of rails, wheels, axles, etc., and the cause of hot boxes. All waters used will be analyzed in the company's laboratory, and no changes in the supply will be made except upon favorable report from the Superintendent of Tests. He will carry out any scientific investigation and perform such other duties as may be assigned him by the Second Vice-President. The Superintendent of Tests will report to the Second Vice-President.

J. H. Simpson has been appointed as Superintendent of Car Service, vice W. A. Vaughan, now General Superintendent of the Alabama Great Southern and fourth division of the Southern. Mr Simpson will have his headquarters in Washington, D. C.

Virginias.—The Columbus, Huntington & Guyandotte Valley has been reorganized under the above name and a new board of directors elected as follows: C. W. Smith, of Chicago; J. L. Caldwell, John H. Holt and C. W. Campbell, of Huntington, W. Va.; J. B. Benson, of Coudersport, Pa.; J. Hotchkiss, of Staunton, Va.; and C. A. Stebbins, of Coudersport, Pa. The following officers for the road have been elected by the new board: C. W. Smith, of Chicago, President; Robert Avery, of New York, Secretary and Treasurer; and C. W. Campbell, of Huntington, Assistant Secretary.

Washington & Columbia River.—The annual meeting of the stockholders was held at Walla Walla, Wash., Oct. 17. The old Board of Trustees was re-elected. The Trustees then met and elected the following officers: President, W. D. Tyler; Vice-President, Theodore B. Wilcox; Secretary and Treasurer, A R. Zabriskie, of Walla Walla, Wash.

Western Maryland.—The directors of this company, who were elected at the stockholders' meeting, Oct. 16, organized last week, and for the twenty-third consecutive term Mr. John M. Hood was elected President and General Manager. Mr. George H. Baer was re-elected Secretary and Treasurer. Mr. Hood was also elected President, and Mr. Baer Secretary and Treasurer, at meetings of the directors of the following branch lines: Western Maryland Tidewater Railway Co., Western Maryland Railroad Terminal Co., Baltimore & Cumberland Valley, Potomac Valley of West Virginia and Potomac Valley Company of Maryland.

RAILROAD CONSTRUCTION, Incorporations, Surveys, Etc.

Bangor & Aroostook.—Work on the Ashland branch is progressing rapidly and 14 miles of rails have already been laid, which brings the track to St. Croix Lake. The buildings, including stations, freight houses, etc., at Ashland Junction, Smyrna Mills, Masardis and Ashland are being rapidly constructed.

The work of removing the old 56-lb. rails between Milo Junction and Oldtown, Me., is going rapidly on and they are being replaced with the heavy 70-lb. rails, the standard section of the road. The rails are now distributed to within three miles of Oldtown and are laid to within six miles of that place. This is on the old section of the road, formerly the Bangor & Piscataquis.

Boston & Maine.—A survey is being made by this company for an extension in the Pemmegewassett Valley, in New Hampshire, a branch to White House Mill, in Lincoln, a distance of five or six miles. This branch will extend into Franconia Notch toward the Profile House, and is intended to accommodate the lumber interests.

Canadian Pacific.—Mr. D. McGillivray, of Vancouver, B. C., who has the contract for the Arrow Lake branch of this company, now has 500 men at work, and although the work was only commenced a few weeks ago the grading on four miles is practically finished. The branch now building is from Wigwam to Arrow Lake, 13 miles, and is one of the several lines building in the southern part of British Columbia to enable the Canadian Pacific to reach the mines in that region. The construction of the line involves only ordinary mountain work.

Detroit & River St. Clair.—This company, recently organized, filed a mortgage at Port Huron, Mich., last week to secure the issue of first mortgage bonds to the amount of $350,000, the Union Trust Co., of Detroit being the trustee.

Duluth, Missabe & Northern.—This road is building the foundation for a merchandise dock alongside of its ore docks at Duluth which is to be 1,200 ft. long. For the present it will be used for a log dam for its second ore dock, to be built this winter. This road contemplates improvements for the coming winter to cost about $500,000.

Duluth & Northwestern.—Articles of incorporation of the company have been filed with the Secretary of State at St. Paul. The object is to build a road from St. Louis Bay, or a point connecting with some road extending to the bay, through the Mesaba Range to Winnipeg. The incorporators are Don Alfred, A. P., J. E. and L. E. Merritt, of Duluth, who are largely interested in the Mesaba Mining region.

Emporium & Mount Jewett.—A charter was granted at the State Department at Harrisburg, Pa., Oct. 26, to this company to build a road from a point on the Emporium & Rich Valley road, in the township of Shippen, Cameron County, then northwesterly to the confluence of Wildcat Run and Marvin Creek, in McKean County. The length of the line will be 17 miles. The office will be at Bradford. The capital stock is $200,000. G. J. Wolf, of Bradford, Pa., is president.

Essington & Chester.—This company has been organized to build a road from Essington to Chester, Delaware County, about four miles. The President is William Simpson, Jr., of Overbrook, Pa.

Florence Southern.—The cross-sectioning of the proposed line from Florence to Silver Cliff, Col., has been completed, final estimates are nearly finished, and the company will shortly be ready to advertise for bids for grading. The promoters of this company feel sanguine that they will make good progress upon the scheme. W. E. Johnson, of Florence, is President of the company.

Georgia & Alabama.—General Manager Cecil Gabbett stated last week that the surveyors will start this week on the location of the new Savannah line. This will extend from Lyons, Ga., the present terminus, to Savannah, and the work will be pushed forward as rapidly as possible. The surveyors will be in charge of Captain F. Y. Dabney, formerly Chief Engineer of the Central of Georgia. The work will begin at Lyons, the eastern terminus of the Georgia & Alabama, and it is expected that the surveyors will reach Savannah within a few weeks. There appears to be no doubt about the purpose of the company to build in as soon as possible. The question of terminals is now under careful consideration, and will perhaps be decided within a short time.

Houston & Texas Central.—The tracklaying on the branch from Calvert, Texas, to the Brown coal-fields has been completed for about two miles to Little Brazos River. Here the tracklaying has been temporarily suspended until the iron bridge across that stream has been erected. The line will be about six miles long and when completed will occasion considerable activity at the coal mines which it reaches. There is also a good deal of fire clay at Calvert which will be made marketable by the building of the new road.

Ishpeming & Lake Superior.—This road, which was incorporated nearly three years ago, by the interests controlling the three greatest iron ore mining companies of the Ishpeming district, the Cleveland, Lake Superior and Lake Augetine, has let the contract for the construction of its line, 15 miles, to Winston Bros., of Minneapolis, and will be hauling ore next spring in competition with the Duluth, South Shore & Atlantic. It will build a very large dock at Marquette. These three mines furnish not far from 900,000 tons of ore, by far the major part of its ore tonnage, to the D., S. S. & A., every year. It is intended to continue the road to a connection with the Chicago, Milwaukee & St. Paul, which now reaches to a point 25 miles west of Ishpeming, and with which close traffic arrangements will be made for business to the South.

Kansas City, Shreveport & Gulf.—The Directors last week elected F. S. Hammond, the General Manager, a director, and Secretary and Treasurer to fill the vacancy caused by the resignation of F. B. Hubbell. Arrangements were made by President E. L. Martin for the commencement of construction from Shreveport, La., south to the gulf, also completion of the terminals in Shreveport. Trains will be running into Shreveport from the North by January next.

Lehigh Valley.—The company will begin at once extending the Easton & Northern from its present terminus, on the outskirts of Easton, to a connection with the company's main line at South Easton. The proposed extension will be about five miles in length, and will encircle a portion of the high hill upon which Easton is situated, thus forming a belt line for a portion of the city. The tracks of the Central of New Jersey will be

crossed overhead, and the line will be carried across the Lehigh River on a substantial bridge to a point near the Lehigh Valley's station at South Easton. Bids for the masonry on the line have already been invited.

Marquette & Iron Range.—This company has been organized in Michigan, and articles of incorporation were filed at Lansing last week. The capital stock is $160,000. No description of the route is given. The incorporators are Hiram A. Burt, William Burt, M. H. Maynard and others.

Mexican Roads.—Samuel Grant, of St. Paul, President of the Orinoco Company, which owns concessions in Venezuela and Hon. Moses Clapp have, according to a press despatch, recently left for Mexico to investigate a proposition to build an 80-mile line to connect with the Mexican International, and to extend to the west coast.

Mexico, Cuernavaca & Pacific.—The Mexico & Acapulco Construction Co., of Colorado, was organized last week to carry out the construction of this road beyond its present terminus to the Pacific Coast. The officers of the company are practically the same as those which have been interested in the construction of the road so far, Mr. J. H. Hampson being at the head of the company. The annual meeting of the stockholders of the railroad was held in Denver, Col., last week, and Mr. J. H. Hamson elected President, and the other officers were also re-elected.

Minneapolis, New Ulm & Southwestern.—Contracts were let last week to P. B. Winston, of Minneapolis, and C. J. Larson, of Winthorp, for the construction of this road from Winthorp to New Ulm, Minn., to be finished Aug. 1, 1896. Work will begin at once. The line will be about 18 miles long connecting at Winthrop with the Minneapolis & St. Louis. The line now under contract will make an important local connection, and it is intended to extend it to connect with the roads to the Missouri River.

Minneapolis, St. Paul & Ashland.—This road, which is designed to open the timber resources of the country south of Ashland, Wis., on the shores of Lake Superior, to compete with Duluth for the commerce of the West, and to give a new outlet to the southwest for the lumber produced on Chequamegon Bay, has actually been commenced. It is hoped to get the line completed to a connection with the Duluth, South Shore & Atlantic, 25 miles out, this winter, and contracts are to be made for hauling logs and timber in the spring. It is said that the company has bought some equipment and rails. The Standard Construction Co. is to do the work. The line will run at a distance of from 10 to 20 miles from the Chicago, St. Paul, Minneapolis & Omaha, for most of its length in a general southwesterly direction, reaching large bodies of white pine timber as well as hardwood, and passing for almost its entire length through a fine farming section, yet largely undeveloped. C. H. Pratt, of Minneapolis, is the active promoter.

Mississippi Valley.—W. J. Strong, of the contracting firm of Carlisle & Strong, and William G. Dacey, of 10 Wall street, New York City, are stated in Western papers to have taken a contract to build this road along the East bank of the Mississippi River south of East St. Louis toward Cairo, Ill. The line has been surveyed in previous years. It is admitted by the contractors that there is no immediate prospect of starting active construction work and that the building of the line depends entirely upon the amount of local aid which is secured by them.

New Roads.—C. A. Epping, of the Warren Land & Lumber Co., will shortly let contracts for building a new road from a point near Warren, Tex., on the road at present operated by that company, connecting the Sabine & East Texas Branch of the Southern Pacific, with the Houston, East & West Texas road.

B. Arentz & Co., of Ocala, Fla., engaged in the phosphate mining industry of Western Florida, are interested in the construction of a proposed road in the western part of Alachua County, from Arredonda, south of Gainesville, to Newberry and Lexington. Surveys are being made by County Surveyor Patton, two routes being proposed. The line will extend through a heavily timbered section, reaching many large phosphate mines, Lexington being in the center of the most important part of the phosphate district. The new road connects with the Florida, Central & Peninsular at its starting point, and it is said that the latter company is interested in its construction. The Plant Lines have been so located as to secure the greater part of the phosphate shipments, and since this traffic became important a number of additional lines through the phosphate district have been added to the Plant system. This new road with the Atlantic, Suwanee River & Gulf road, which is being built by the Ambler Lumber Co., will give the Florida, Central & Peninsular an opportunity to secure a considerable portion of the phosphate traffic, which will then be carried over that road to Fernandina instead of going to Savannah, as at present, over the Plant Lines.

Messrs. Lloyd & Duncan, who have leased the coal mines located about 16 miles south of Thornton, Tex., propose to build a branch road from the mines north to the town of Thornton, and thence northwest to the important town of Waco.

A road from Buckhannon, W. Va., to the mouth of the Buckhannon River, about 12 miles, is proposed by local interests. At the mouth of the river, it will connect with the Grafton & Belington road, which will give a direct outlet to botb the West Virginia Central & Pittsburg and Baltimore & Ohio roads. At Buckhannon it will connect with the West Virginia & Pittsburg road of the Camden system. Upshur County will be asked to award to the company a subscription which the county promised some time since to a road built over the route mentioned. The road will open fine coal and timber territory which at present is inaccessible.

Business men of Canon City, Col., including some citizens who have lately struck rich ore in Cripple Creek mines, are making effort to secure the construction of a railroad between Canon and Cripple Creek, to compete with the Florence & Cripple Creek line.

Northern Alabama.—Application for a charter for this company was filed in Alabama some days ago, by Messrs. R. T. Simpson, G. P. Jones and R. T. Simpson, Jr., of Florence, Ala. It now develops that the charter was intended to provide for the reorganization of the Birmingham, Sheffield & Tennessee River road, from Sheffield, Ala., to Jasper, Ala. The latter road was recently foreclosed and bought in by the bondholders. According to the Alabama law it will be necessary to open books for public subscription, and the stock of the new company to the amount of $3,000,000 will be subscribed by the purchasers of the B., S. & T. property. It is stated that it is the purpose of the new company to extend its lines from Jasper to Birmingham, and from Sheffield north to some point in Tennessee, without delay.

Pennsylvania.—President Roberts, who has just returned from the annual tour of inspection of the property, outlined the improvements to be made as follows: "On the Eastern system the principal work contemplated is a continuation of the revision and straightening of the lines. We propose to take out more of the curves, and, in fact, all that we possibly can. In the West we will lengthen our double track and add to the equipment in various ways. We have ordered 6,000 freight cars, which will be built and delivered during the year. At Pittsburgh we contemplate the building of a new freight station, and at Columbus, O., a similar structure will shortly be erected. The bridge over the Ohio River from Newport to Cincinnati will be completed during the winter."

It has been decided to push the work of completing the fourth track begun at certain points along the main line before the late business depression. The points where this work is to be done are as follows: From Atglen to Gap, three miles; Rockville bridge to Cove Forge, four miles; Tyrone to Elizabeth Furnace, ten miles; Blairsville Intersection to Derry, five miles.

Pennsylvania Midland.—This partly constructed line, in Bedford, Blair and Somerset counties, passed into the nands of a receiver last week, the court appointing J. W. Rutherford, of New York, to that position. Work on the line was discontinued a week or so ago for want of material. The moving spirit in this enterprise has been Theodore Gerrish, a Portland (Me.) capitalist, who owns considerable mining and timber property in the section to be traversed by the road. That it will be ultimately built is not doubted.

Pittsburgh, Cincinnati, Chicago & St. Louis.—The Pennsylvania is doing considerable expensive and difficult work on this road in the widening of the two long tunnels between Shelby and Miller's station. The two tunnels have an aggregate length of about 3,000 ft., and are solid rock all the way through. There are 500 men at work at present and the contractor expects to have the work completed by next June.

Pittsburgh, Virginia & Charleston.—It is stated that this road, which is a division of the Pennsylvania, is to be double track between Monongahela and Dravosburg, Pa., as soon as the company secures the right of way needed for the track. The distance between the two points is about 15 miles.

Port Huron & Lexington.—Mr. Edgar H. Brennan, of Toledo, has revived this project for a line along the coast of Michigan from Port Huron north to Lexington, about 25 miles. He now states that if the local aid heretofore offered by the towns and the district through which the new road is to be built is renewed that he will be able to carry out the building of the road. He claims that he has arranged with the Merchants' National Bank of Toledo and business men of that city for the funds to complete the line.

Portland & Rumford Falls.—There is some talk of this company building a branch from Poland to Norway, Me., through the towns of Page's Mills, Welchville, Oxford and Norway.

Ruthven & Jackson.—Contracts have been awarded and work commenced on the grading of this road in Iowa, about seven miles long, extending north from the north terminus of the Ruthven & Des Moines division of the Chicago, Rock Island & Pacific, through Spirit Lake to Jackson, Minn. It is said that the Rock Island has agreed to lease the new line when completed, and that it is intended to extend it to Mankato, where it will connect with the Watertown, Mankato, and Red Wing divisions of the old Minneapolis & St. Louis.

St. Lawrence & Adirondack.—The contract for building the Southwestern road, an extension of this road, into Montreal, between Beauharnois and Caughnawaga, Que., has been given at about $120,000. This is for grading, masonry and timber work for the distance of 13 miles, the company furnishing the rails and building the station houses. The road will be a first-class one in every respect, and the line will be laid with 80-lb. rails. The tenders called for the completion of the line by July There will be a good deal of stones and boulders to contend with, and, of course, quite a gang of men will be employed throughout the winter. The bridge across the Chateauguay River, which is to have stone piers and iron superstructure, will be 450 ft. in length and will be of considerable importance. The completion of this road will shorten the distance to Beauharnois to 22 miles.

Ulster & Delaware.—The officers of the company have been busy since the annual meeting in securing the right of way for the proposed extension from the present terminus to the Hudson River. It is stated that they have not been very successful in this work, and that on account of the high prices asked for property it has been decided to begin condemnation proceedings, and these suits will be instituted promptly. It is thought that the right of way will be secured to enable the company to begin construction work as early in the spring as the weather permits. The extension is to begin at Summitville, extending down the Rondout Valley to the Hudson River, at Kingston, N. Y. Vice-President Lafe Pence has asked the Kingston Board of Trade to subscribe $10,000 toward the building of this extension, and the Board has undertaken to secure this sum.

Union Pacific, Denver & Gulf.—Local interests at Cheyenne and at Hartville, Wyo., are urging the management to construct a short branch from a point on the Cheyenne & Northern to iron and copper mines near Hartville. This would involve the construction of a line about six miles long, probably from a point near Wildover station to Hartville, which is located beyond the North Platte River, which would have to be crossed by an iron bridge.

Virginia.—The Columbus, Hocking & Guyandotte Valley road in West Virginia has been reorganized under the above name, as stated last week, Mr. J. L. Caldwell, of Huntington, W. Va., continuing as Vice-President of the new company. The President is Mr. C. W. Smith, of Chicago and Robert Avery, of 47 Broadway, New York City, is Secretary. These new officers were elected to represent the capitalists who have become interested in the project, and have agreed to furnish the funds for constructing the road if certain local conditions are settled. The contract for building the road has been formally let to William G. Dacey, of 40 Wall street, New York, and the Guyandotte Construction Co. The road is to commence at Huntington in Cabell County, W. Va., on the Ohio River, and extend up the Guyandotte River Valley to Pineville in Wyoming County and thence to the West Virginia State line.

Washington Shore Line.—James Mitchell, of Portland, Me., who, with George Westfield, has the contract for building this line along the coast line of Washington County, Me., has at present about 300 men at work near Machais. This is the most important town which will be reached by the road, and is directly on the coast about half way between the proposed terminal points. The eastern terminus of the road will be at Eastport, Me., near the international boundary line, but the new surveys now being made started at Machais, and the engineers are working west from that town. The contractor has established his headquarters at Machais, removing from Portland.

Wiscasset & Quebec.—The Board of Railroad Commissioners of Maine has issued a certificate to the railroad to operate the extensions of its lines from China to Albion, Me., about 10 miles.

GENERAL RAILROAD NEWS.

Caledonian Iron & Mining Co.—This company is preparing to tear up the track on its four-mile road from the old furnace of the company in Franklin County, Pa., to Wolf's Hill Tunnel.

Canadian Pacific.—The company reports its earnings for September as follows:

	1895.	1894.	1893.
Gross earn	$1,820,398	$1,776,058	$1,918,314
Oper. exp	1,075,853	1,102 852	1,116,478
Net earn	$744,545	$673 206	$801,836
Prop. exp. to gross	59	62⅛	58¼
Net 9 months	4,488,773	4,408,960	5,296,779

Carolina, Cumberland Gap & Chicago.—This road, about 26 miles in length, was sold by Special Master J. E. Hagwood, in Charleston, S. C., on Oct. 29, for $67,000. There were two bidders, Mr. N. G. Evans and Mr J. D. Reynolds. The latter, representing the bondholders, was the purchaser.

Chesapeake & Ohio.—The statement of earnings for September is as follows:

	1895.	1894.	1893.
Gross earn	$831,510	$789,304	$852 098
Oper. exp. and taxes	561,259	526.362	531,445
Net earn	$270,251	$262.942	$320,653
Prop. exp. to gross	67¾	66¾	62⅝
Net three months	815.275	894.053	934,886

Net September earnings in 1892, were $304,634; in 1891, $240,033, and in 1890, $190,255.

Chicago, Burlington & Quincy.—The earnings for September for three years are reported below:

	1895.	1894.	1893.
Gross earn	$3,098 106	$2 829,846	$3,520,194
Oper. exp	1,709,071	1,604,942	1 946,544
Net earn	$1,389 035	$1,224,904	$1,573 650
Prop expense to gross	55¼	56¾	55¼
Fixed charges	814,092	796,440	822 881
Surplus	$574,943	$428,464	750.769
Sur. 9 mos	793,513	1,537,194	2,036 286

The net September earnings in 1892 were $1,722,166; in 1891, $1,616.844; in 1890, $1,326,488. Freight earnings for September increased $1,982,312; passenger earnings, $50,311.

Chicago, Peoria & St. Louis.—Judge Allen, of the United States Court at Springfield, Ill., has again deferred action in the matter of confirmation of the sale of this property. The time for hearing exceptions to the Master's report is now set for Nov. 9.

Colorado Midland.—Under the management of Receiver Ristine this road is entering upon the winter season in fairly good physical condition. The roadbed has been given considerable attention, and all the available rolling stock has been overhauled and repaired. The financial condition of the company has received from the receiver the most careful attention, and the progress already made seems hopeful of still better work later on. Business in the state is certainly reviving, and traffic shows an increase from all stations The ore shipments are now greater than at any time since 1892.

Findlay, Fort Wayne & Western.—The company has completed a connection with the Carey branch of the Big Four, and within a few days will begin running trains between Fort Wayne and Akron, O., running from Findlay to Carey on the Big Four tracks, and from Carey to Akron, via the Northern Ohio road. Negotiations are pending for the purchase of the Carey branch by the Findlay, Fort Wayne & Western.

Georgia Southern & Florida.—The Receiver of the property, now controlled by the Southern Railway, reports for the fiscal year ending June 30 an increase in gross earnings compared with 1894, of $12,506, decrease in operating expenses of $35,203, and increase in net earnings of $47,709. During the years 1894 and 1895 the receiver spent extraordinary sums in improving roadbed, filling trestles, repairing bridges and culverts, and in Rebuilding equipment. To this fact President Shaw attributes the noticeable reduction in expenses in the quarter ending Sept. 30, 1895. The company had on hand, Sept. 30, $133,131 cash, accumulated from earnings. There will be no interest payments until Jan. 1, when the first coupon on the first five per cents. matures. This will call for only $89,600.

Indianapolis, Decatur & Western.—At a meeting of the stockholders of this company this week a resolution was passed authorizing the directors to issue $1,824,000 of new bonds.

Norfolk & Southern.—The company reports its earnings for the year ending June 30 as follows.

	1895.	1894	Inc. or dec.
Gross earn	$436 595	$435,383	I. $1,212
Expenses and taxes	281,966	297 824	D. 15,858
Net earn	$154,629	$137,559	I. $17.070
Interest charges	37,107	33 000	I. 4.107
Balance	$117,522	$104,559	I. $ 2,963
Other income	2,042	3,533	D 1,496
Total income	$119,564	$108 097	I. $11.467
Dividend 4 per cent	80,000	80,000	
Surplus	$39,564	$28.097	I. $11.467
Betterments	19,971	9,182	I. 10,789
Balance surplus	$19,593	$18,915	I. 678

The amount earned on the stock was 5.97 per cent., against 5.40 per cent. the previous year. The operating expenses, including taxes, were 64 58 per cent. of gross earnings, against 68.40 per cent. the previous year. An increase of $90,000 was made in the bonded debt to acquire additional terminal property at Berkley and Norfolk.

Northern Ohio.—Messrs. Vermilye & Co., bankers of New York City, offered for public subscription this week the first mortgage bonds of this company to the amount

of $2,500,000. These bonds are a portion of an issue for $5,000,000 bearing six per cent. interest, the principal and interest being guaranteed by the Lake Erie & Western As will be remembered, this company was organized to succeed the old Pittsburgh, Akron & Western, and has been leased by the Lake Erie & Western. It operates 166 miles of line from Delphos to Akron, O., extending through 10 counties of Northern Ohio. The company retains $1,500,000 of the bonds in its treasury to provide for additional equipment and roadway equipment and for extensions. The bonds were offered for subscription at 103 and were over subscribed.

Northern Pacific.—Counsel for the railroad company, for the Farmer's Loan & Trust Co., trustee of the second third and consolidated mortgages, and for the Adams Committee, appeared before Judge Lacombe, in the United States Circuit Court at New York, on Oct. 26, and united in an application that, without deciding any of the questions regarding primary jurisdictions of the different courts, he should appoint a resident of New York as Receiver of the company. They also united specifically in the recommendation of Robert M. Gallaway for that position as acceptable to all parties in interest. Judge Lacombe suggested that if he made this appointment it might only further embarass the judges in the other circuit courts and further complicate the situation. He suggested that the motion be postponed in the hope that very soon counsel would make application to the various judges having charge of the property, requesting them to unite in the appointment of receivers over the whole line. The application was accordingly withdrawn for the present.

Paducah, Tennessee & Alabama.—This road, sold at Paducah, Ky., on Oct. 18, to Judge J. W. Phillips, of St. Louis, by Special Commissioners J. R. Puryear and A. B. Lamb for $1,000,000. The sale was made under foreclosure proceedings. It is presumed that the road was bought in for the bondholders. Judge Phillips was the purchaser of the Tennessee Midland at the recent foreclosure sale of that property. The two companies operate between them 255 miles of road, from Memphis to the Tennessee River (the Tennessee Midland), and from Lexington on this division to Paducah, Ky.

Pennsylvania.—The statement of earnings for September shows that the company is doing a large and profitable business. East of Pittsburgh the gross earnings increased $288,000, but net earnings were only $20,000 more than last year. For the year to date the gross earnings east of Pittsburgh increased $4,602,000 and the net earnings $1,026,000. West of Pittsburgh the gross for the month increased $259,000 and the net $137,000, while for the year west of Pittsburgh the gross has increased $3,255,000 and the net $1,958,000. The following shows the increase for the year on the whole system:

	Gross earn.	Net earn.
East of Pittsburgh	$4,602,031	$1,026,944
West of Pittsburgh	3,255,505	1,958,255
Whole system	$7,857,536	$2,985,199

Philadelphia & Reading.—Frederick P. Olcott, of New York, Chairman of the Reorganization Committee, said this week that the reorganization plan would be given out very soon. There have been deposited with the committee $38,000,000 of the $44,000,000 of general mortgage bonds. These bonds do not include those controlled by J. P. Morgan & Co. It cannot yet be definitely stated how the income bonds will be treated, nor what the assessment on the stock will be.

The following statement shows the earnings of the railroad company for September, 1895, as compared with that month in the previous year:

	1895.	1894.	1893.
Gross earn.	$1,091,561	$1,785,150	$1,946,296
Oper. exp.	1,018,655	962,927	1,019,269
Net earn.	$912,905	$822,223	$927,327
Propor. exp. to gross	52¼	53⅞	52⅝
Total income	937,591	840,396	963 114
Other payments	148,073	336 927	249,416
Fixed charges	705,000	704,470	718,679
Total charges	$853,073	$1,041,397	$968,125
Surplus	84,518	Def. 201,001	Def. 5,011
Net ten months	7,392,488	7,040,239	7,360,930
Deficit, ten months	579,211	1,498,076	1,058,593

The company's surplus after charges in September, 1892, was $477,715; in 1891, $423,888. The gross earnings of the Coal & Iron Co. were $2,345,260 in 1895, and $1,793,033 in 1894. The deficit for the ten months in 1895 was $1,699,463 and in 1894 was $1,086,390.

Pittsburgh, Cincinnati, Chicago & St. Louis.—The company has negotiated the sale of $6,000,000 four per cent. bonds, guaranteed by the Pennsylvania Company, with Messrs. Speyer & Co. and Kuhn, Loeb & Co., of New York. The issue is made for refunding purposes, to take the place of 4½ per cent. bonds soon maturing.

Raleigh & Augusta.—To provide funds for building a new freight house at Atlanta, and for other improvements, the Seaboard Air Line has placed on the market $456,000 of first mortgage six per cent. bonds of the Raleigh & Augusta Air Line. These bonds have been taken by the Mercantile Trust & Deposit Co. and the Baltimore Trust & Guarantee Co., and are being offered to investors at 105 and accrued interest. A circular issued by these companies shows that the Raleigh & Augusta road, which extends from Raleigh to Gibson, N. C., 107 miles, forming an important link in the through line to Atlanta, has a total bonded indebtedness of $1,000,000, or about $9,300 per mile. This mortgage was created in 1886. At that time $500,000 of the bonds were sold and are held by Baltimore and New York investors. The bonds now offered have been held in the treasury of the Seaboard Air Line. Besides the work to be done at Atlanta the proceeds from the sale of these bonds will provide for rebuilding the freight sheds recently burned at Portsmouth, Va., and other improvements along the line.

Southern.—The earnings of the company for September for three years are shown in the following table:

	1895.	1894.	1893.
Gross earn.	$1,635,674	$1,534,831	$1,413,228
Oper. exp., taxes	1,088.500	1,026,215	984,520
Net earn.	$547,174	$508,616	$428,708
Prop. exp. to gross	66¼	66¾	69¾
Net three months	1,362,668	1,191,016	740,846

Tennessee Central.—Col. C. O. Godfrey has been appointed Receiver. The appointment was resorted to, President Jere Baxter says, in order that the road might be completed. Owing to the fact that there were several conflicting liens on the road, financiers were unwilling to advance money, but now, it is understood, the money will be advanced on receiver's certificates in a sufficient amount to push the road to completion. There are now 300 state convicts in camp on the line of the road, and the contractors are ready and willing to resume work as soon as ordered. Nothing has been done on the road since August. The roadbed has been constructed about 35 miles and one-half of a 600-ft. tunnel has been opened up. About 100,000 crossties have been distributed along the line. The road joins the Cincinnati Southern at Harriman, Tenn., and it is proposed to build to Knoxville

TRAFFIC.

Traffic Notes.

On Oct. 24 the Erie lines ran a half-rate excursion from Chicago to New York, taking 525 passengers.

An officer of the Seaboard Air Line says that the business of the company is very heavy, not only in consequence of the Atlanta Exposition, but as regards general freight. The company could use 25 more locomotives.

In the United States Court in St. Louis last Tuesday Eugene Field, agent of the Lackawanna Line, who was indicted four years ago on the charge of violating the Interstate Commerce law in granting a rebate on freight from St. Louis to New York, pleaded guilty.

President Van Horne, of the Canadian Pacific road, stated at St. Paul this week that his road will haul this year, from Manitoba and the Northwest Territories 160 per cent. more cattle than ever before, amounting to about 50,000 head; and that the mining developments in the Kootenai region in British Columbia are of great importance.

The railroads between Colorado and Utah have stopped cutting rates on short trips in Utah and are also trying to prevent scalping on through tickets. Through tickets to and from Denver read via Pueblo, and through tickets to and from Pueblo read via Denver, and there is $3 or $4 profit on each one if a deal can be made with a broker. It is proposed to limit the tickets to continuous journeys and connecting trains.

The Erie is to materially shorten the time of its limited train, which now leaves Jersey City at 3:15 p. m., arriving Chicago at 7:10 p. m. the following day. On and after Nov. 4 the train will leave Jersey City at 2:30 p. m. and arrive at Chicago at 5:30 p. m., in season to connect with the new California limited on the Atchison, Topeka & Santa Fe. At the same time it will put on this train new mail cars, having been awarded a fast mail contract.

The bureau of the Western Passenger Association which issues half fare permits to clergymen dealt with 29,000 applications during the first 9 months of 1895 and 6,952 of these were disapproved. Of the latter number 2,698 were of persons who refused to have their applications investigated. Half fare permits to pastors in charge of churches are issued by the roads individually and are not included in the foregoing figures. The bureau costs about $4,000 a year, there being 10 clerks engaged in it. A western paper, from which these statements are taken, says that the rigid adherence to strict rules in this bureau has caused a decrease of 65,000 permits during the year 1895 thus far, from the number issued the year before.

The Interstate Commerce Commission has issued a decision on the Independent Refiners' Associations' claims, holding that the roads which could not furnish tank cars should refund to the claimants $84,949 overcharges on oil which the shippers were compelled to send in barrels. It will be remembered that in November, 1892, the Commission found that charging for the weight of barrels, on oil shipped to eastern points, was unjust; the present decision is based on that order and covers shipments made between Sept. 3, 1888 and May 15, 1894. The claims against the Pennsylvania Railroad and the Western New York & Pennsylvania are left unsettled, the Commission being unable to decide whether or not those roads had a sufficient supply of tank cars. It is held that the claims against these companies must be taken to the courts.

The New York Board of Trade & Transportation has issued a circular to the merchants of the city asking what aid, if any, they derived from the stop-over privilege granted by the railroads last July and August, under which people from the Western States bound to the Christian Endeavor and Knight Templar conventions at Boston were enabled to stop off in New York City; and some of the replies are published. One firm (wholesale millinery) replied that 50 or more of its customers took advantage of the excursion tickets. Others were equally gratified, but could not give definite figures. Some had secured new customers. One firm found itself overworked, and on some accounts wished that the business could have been spread over a longer time. The Board of Trade & Transportation takes the credit for having secured this stop-over privilege.

The suit in the local court at Elmira, N. Y., against the New York, Lake Erie & Western to compel compliance with the New York state law requiring the issuance of 1,000-mile tickets at two cents a mile, has been decided against the railroad company. The judge holds that the requirement that the defendant company shall issue a mileage book is not prima facie so unreasonable as can be held in law to be an unlawful interference with the right of the company to transact its business. The corporation exists and acts by legislative permission, subject to any legislative control and direction which does not amount to a destruction of its property. The question cannot be raised upon demurrer to the complaint that this regulation is so far unreasonable as to impair the charter rights of the defendant company. The act of the Legislature must be construed to require the acceptance of the mileage ticket for transportation from one point to another within the state.

Commissioner W. H. Masters, of the New Orleans Bureau of Freight and Transportation, Limited, has issued his second annual report, which is for the year ending Oct. 1. It gives in detail the reduction in freight rates on the railroads, and other advantages which the Bureau has secured for the merchants of New Orleans. There are also a dozen or two paragraphs concerning demands made upon the railroads which are still the subject of negotiation. During the year the Bureau has handled 339 claims; of these 238 have been paid, 26 withdrawn, 16 declined by the Bureau, 9 declined by the railroad companies and 50 are pending. Mr. Masters says that bureaus now exist at Galveston, Fort Worth, Dallas, Memphis, Mobile, Savannah, Charleston and Richmond, and that San Antonio and Montgomery are preparing to establish them. The Commissioner finds traffic associations of material benefit in facilitating his dealings with the railroads, and expresses the hope that the reorganization of the Southern Railway & Steamship Association will be successful.

The hearing on the application of the Southern Pacific Co. to have the California Railroad Commissioners permanently enjoined from refusing freight rates, has been fixed for Nov. 4. The railroad company in its complaint, on which the temporary injunction was granted, presented an elaborate statement of the cost and indebtedness of the roads operated by it, emphasizing the fact that it had to pay the United States 25 per cent. of the net earnings of the Central Pacific, besides keeping up a sinking fund. None of the leased roads has received any dividends for more than a year, except the California Pacific and the Northern Railway Co. It is stated that the interstate traffic of the company is conducted at rates fixed under an act of Congress; that the intrastate rates in Oregon are fixed by the railroad commissioners, and that those now in force in California, likewise fixed by the commissioners, are lower, both actually and relatively, than those in Oregon and Nevada. It is averred that freight rates have been reduced by the company in the past wherever it has been reasonably possible to do so, and that the average revenue per ton per mile has decreased gradually from 1.99 cents in 1889 to 1.24 cents in the year ending June 30, 1895. Strict prudence and economy have been practised in the operation of the affairs of the company. It is claimed that the reductions now ordered are made arbitrarily and without any evidence that the reduced rates would be just or reasonable.

Chicago Traffic Matters.

CHICAGO, Oct. 30, 1895.

The seat of news regarding traffic is moved to St. Louis this week, where the officials are hard at work endeavoring to fix up a new freight agreement.

The passenger agents are still at work on the details of the proposed new agreement, but have not yet reached a satisfactory conclusion. There is considerable difficulty being experienced in endeavoring to fix up matters in separate portions of the territory before a general agreement is arrived at.

The new California passenger service of the Santa Fe has stirred up the other lines, and now the Northwestern and Union Pacific state that they will presently knock off about eight hours from their existing schedule from Chicago to San Francisco.

The Illinois lines have decided not to take individual action in future in regard to any rulings of the State Board of Railroad and Warehouse Commissioners, but to call a meeting, and pass upon all such rulings jointly.

The Chicago & Eastern Illinois has arranged for through train service from Chicago to Nashville at increased speed during the Atlanta Exposition, the new train leaving Chicago at 5:02 p. m. and arriving at Atlanta at 5 p. m. the next day.

Eastbound all-rail shipments fell off slightly last week, the entire loss being in grain and dressed beef.

Chairman Midgley, of the Western Freight Association, rules that since the dissolution of the Western Traffic Association the Western Freight Association is supreme in its own territory, as is the trans-Missouri Rate Committee in its territory; and that the latter has no right to make rates which produce reductions in territory between Chicago and the Missouri River, unless the lines, members of the Western Freight Association, consent.

The shipments of eastbound freight, not including live stock, from Chicago, by all the lines for the week ending Oct. 26, amounted to 82,220 tons against 86,023 tons during the preceding week, a decrease of 3,803 tons, and against 47,526 tons for the corresponding week last year. The proportions carried by each road were:

Roads.	Week to Oct. 19		Week to Oct. 12.	
	Tons.	p. c.	Tons.	p. c.
Michigan Central	10,328	12.6	7,375	8.6
Wabash	7,201	8.8	7,636	8.9
Lake Shore & Mich. South.	14,427	17.6	15,399	17 9
Pitts., Ft. Wayne & Chicago	8,657	10 5	9,327	10.9
Pitts., Cin., Chi. & St. Louis.	8,825	10 7	7,804	9.1
Baltimore & Ohio	4,784	5.8	5,593	6.5
Chicago & Grand Trunk	7,060	8.6	8,302	9.6
New York, Chic. & St. Louis	7,936	9.7	7,450	8.6
Chicago & Erie	9,477	11.5	11,785	13.7
C., C., C. & St. Louis	3,525	4.2	5,361	6.2
Total	82,220	100.0	86,023	100.0

Of the above shipments 3,126 tons were flour, 44,662 tons grain and mill stuff, 11,801 tons cured meats, 9,871 tons dressed beef, 1,573 tons butter, 1,349 tons hides, and 4,701 tons lumber. The three Vanderbilt lines carried 39.9 per cent.; the two Pennsylvania lines 21.2 per cent.

Loosing Traffic in Minnesota.

Contracts have been made by four northwestern roads, the Duluth, Missabe & Northern, the Duluth & Iron Range, the Eastern Minnesota and the Northern Pacific, for hauling about 100,000,000 ft. of logs during the coming winter from points close to the head of Lake Superior to the lake. This is in addition to the Duluth, Mississippi River & Northern, and the Brainerd & Northern Minnesota, which are designed primarily for log traffic, and which will handle during the winter not less than 275,000,000 ft. These figures show the magnitude of the log traffic in Northern Minnesota.

Traffic Conditions in the South.

On the general situation in the South, Mr. Samuel Spencer, President of the Southern Railway, is quoted in the New York papers as follows:

"Only about five per cent. of the gross earnings of the Southern Railway are derived from cotton freight, so that, even if the crop should be as small as some authorities predict the difference in the earnings of the company from that source is not worth considering. General business will be much larger this winter, because the planters will get better prices for their cotton and other crops will show better yields. The successful formation of the Southern States Freight Association and the putting of the agreement into practical operation on Monday last have had a steadying effect on rates and created a confidence which has not existed in the South for two or three years.

"I now understand that the Florida Central & Peninsular Railroad will at once become a member of the association. It has not been a member for some years. This will bring into the association the Florida lines of the Plant system, which have heretofore been outside of it on account of the non-membership of the Florida Central & Peninsular. All this materially strengthens the association and increases confidence.

"If rates are well maintained, as now expected, the small cotton crop as compared with last year will not injuriously affect the earnings of the Southern railways. This is particularly true of the lines east of the Mississippi River, where the shortage is by no means as great as it is west of the Mississippi.

"The revival of manufacturing industries promises also to far more than compensate for any possible shortage in cotton. This shortage has apparently been much exaggerated. All in all, the outlook for the autumn and winter business of the Southern railways is encouraging."